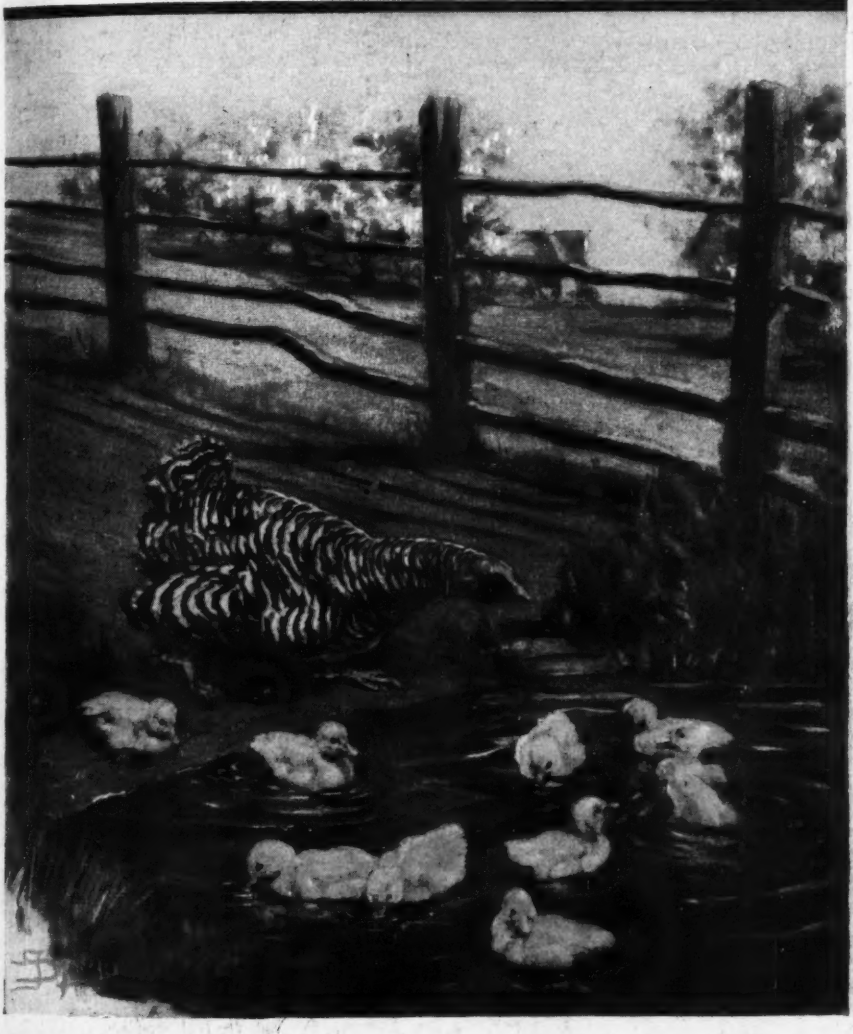
Better Crops

The Pocket Book of Agriculture.

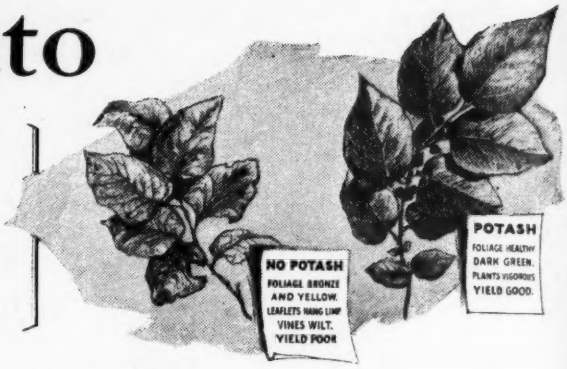
May 1926 10 Cents



This time: Competition — Ask the Soil — Potash and Quality — Unbending Backs in Farming — Minnesota

Potato

plants tell of their hunger with these symptoms—


NO POTASH
FOLIAGE BRONZE AND YELLOW. LEAFLETS HANG LIMP VINES WILT. YIELD POOR
POTASH
FOLIAGE HEALTHY DARK GREEN. PLANTS VIGOROUS YIELD GOOD.

YOU may eat three hearty meals a day but if your food is unbalanced you know what happens.

A potato plant suffers in a similar way. Its food must be properly balanced . . . it must have nitrogen, phosphoric acid, and potash in correct proportions.

If nitrogen is lacking the leaves turn yellow and the vines lack vigor. Insufficient phosphoric acid delays maturity.

You first notice signs of potash hunger in the foliage. The leaves develop a bronzed and yellow color; later the leaflets hang limp . . . the vines wilt.

Field demonstrations have shown that complete fertilizers containing 100 to 150 lbs. of actual potash per acre bring good returns.

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Sales Agents—H. J. Baker & Bro., 81 Fulton St., New York
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91 extra bushels per acre!

The Rhode Island Experiment Station has reported an interesting experiment made with fertilizers on potatoes.

When a complete fertilizer containing 50 lbs. of actual potash was used, the yield was 143 bushels per acre. But note the following:

When a complete fertilizer containing 150 lbs. of actual potash was used, the yield increased to 234 bushels per acre. An increase of 91 bushels per acre for an extra 100 lbs. of actual potash. Potash Pays!

Genuine German

POTASH

Better Crops

The Pocket Book of Agriculture

The Whole Truth—Not Selected Truth

VOLUME VI NUMBER THREE

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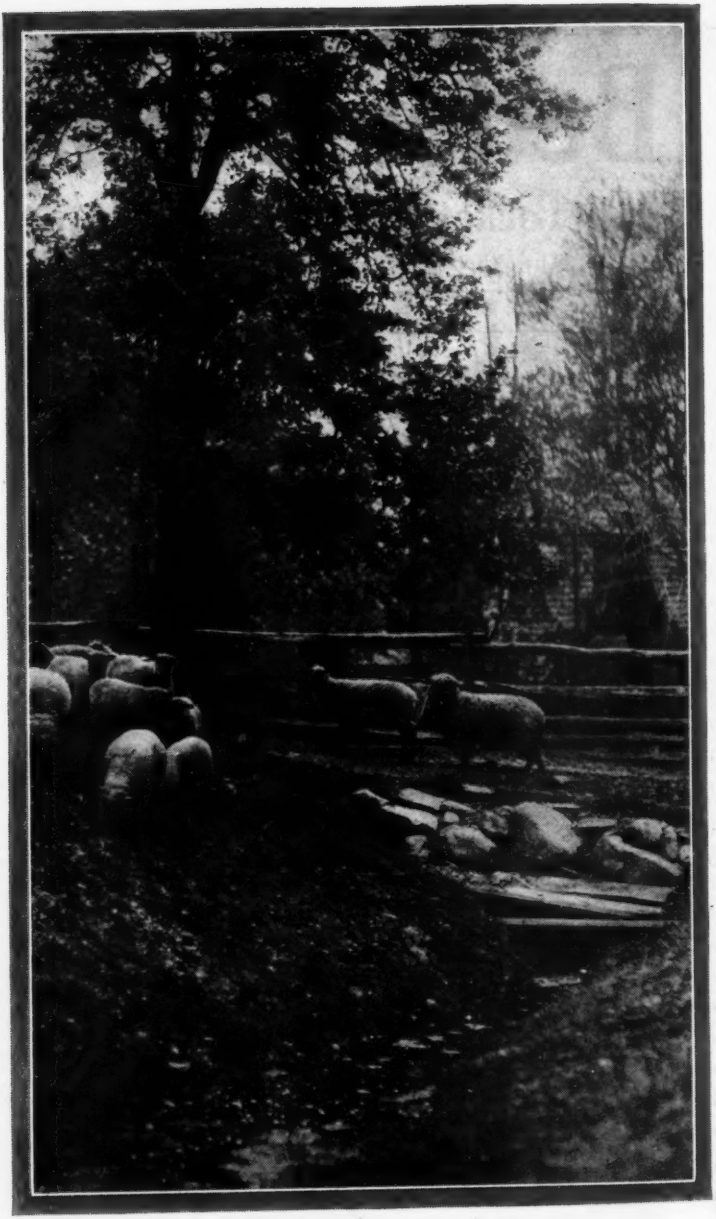

As it fell upon a day
In the merry month of May

—Richard Barnfield

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VOL. VI NEW YORK, MAY, 1926 No. 3

¶ *An article of intense interest on the always new subject of*

COMPETITION

Direct *and* Indirect

By Jeff McDermid

W. DUDLEY HAMMERSMITH, small-town jeweler, is a changed man.

The whole course of his life has swung into a strange channel; for W. Dudley has a New Idea.

That I gave him the thought is beside the point, and I submit that when two men each have one idea and exchange them they then have two apiece. W. Dudley, in return for my idea, gave me the incentive for this story. And multiplication by this method is fair, brotherly, honest and altogether good.

IN W. Dudley's town is but a single jewelry store. W. Dudley—he is it. Outside the occasional postal jaunt to the mail order house, all the money spent for jewelry in that community must go through his hands.

So, this jeweler-monopolist has always looked upon himself as a keen, cagey, sagacious business man, who had the acumen and foresight to find a town where there was no competition.

"No competition" was the foundation of what mediocre success he

was enjoying when I discovered him. The only fly in his ointment was the apprehenson that some other Jeweler might discover his sinecure and open a competing store.

He eyed the signs on vacant stores furtively, always fearing to see an announcement of competition. He often awoke at night with a start, his brow beaded with cold sweat, from a nightmare in which he found his store in a row of jewelry shops, with himself pacing back and forth in his doorway, wringing his hands and pleading with the passing populace to please come in and purchase.

"NO competition"!

And then, fortunately or unfortunately, I hove into his cosmic consciousness with An Idea.

As we stood idly talking, leaning on his counter of silverware, he told me of his moderate profits, due to his vision in selecting a seat of operations free from the opposition of competing jewelers.

"O, a few send to the mail order houses, and one or two families shop in Cedar Rapids, but", with becoming modesty and yet a mild mental slapping of himself on the back, "I get ninety-nine per cent of the jewelry business in this town; they *have* to come to me!"

As he said this, thoughts began to race through my head—on competition and such things.

"They *have* to come to me!" he proclaimed.

Across the street was the Arcadia—"Gem of Film Playhouses." In front were parked two dozen or more empty perambulators. Nosed to the curb were flivvers packed side by side—like pencils in a box.

Suddenly, The Idea shot through my brain, full-fledged. "How much business does the Arcadia over there do in a day?" I asked.

"Oh," deprecatingly, "Sam Felton tells me—he's the owner—that he averages about a hundred dollars a day "take-in"; he has lots of competition, you see; three other houses in town, two of them bigger and better than his Arcadia, with more central locations. Sam does well—considering his competition!" he ended, magnanimously.

"Do *you* do a hundred dollars a day?" I shot back.

He looked at me quizzically a long moment.

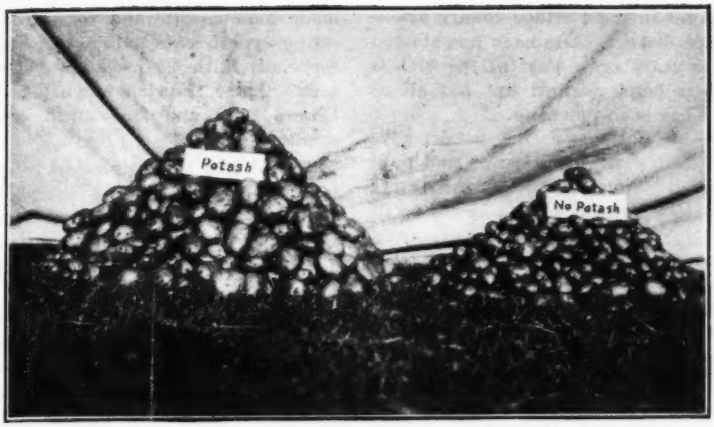
"No, I do not—I don't *average* that. Some days, of course", he started lamely—"but, naturally, folks don't spend the money on jewelry they do on the movies", he followed, brightly.

"W. Dudley Hammersmith!" I bellowed; "you're a chump! You think you're free from competition; you're not. No one is. I've just got An Idea. I must cherish it. It's an orphan. Right over there at the Arcadia today a hundred dollars is being slid under the wicket. Half of that money could be yours—if you could convince the people of this town that, instead of *spending* money to enjoy a show, they should *invest* it in jewelry that could be used and enjoyed during their lifetime—and then passed down as a heritage to their grandchildren."

"Wait", I persisted, as he started to stammer a rebuttal, "Wait! *Here's some more!* You think you have no competition. And you make no efforts to build your business. You get nearly all the jewelry trade in this town. Yes. But what do you get? You've got *stiff* competition! Every merchant in town is your competitor. Ford is your competitor—every dollar spent for a new car *might* be spent over your counter".

"Not only that"—the words flooding from me—"You have been

(*Turn to page 62*)



$4.50 worth of potash produced 109 bu. more No. 1's per A

ASK *the* SOIL

By

G. J. *Gallister*

¶ *An interview with a live county agent and one of his enthusiastic farmers*

"IT would be difficult to measure that man's influence in the growing of better crops in his community. Farmers come from miles around to ask him questions and they believe him because he has asked the soil."

"That" man is James Isherwood, a dirt farmer whose address is Plover, Wisconsin, and the speaker was H. R. Noble, agricultural agent of Portage county in which Mr. Isherwood lives.

I had heard that several farmers in this Badger county had been cooperating very successfully in solving some of their crop and fertilizer problems and wanted to know more about it. Consequently I called upon Mr. Noble a few weeks ago in his office at Stevens Point. He told me of farmers who had successfully seeded alfalfa on sandy and marsh soils and of one farmer who had kept careful records of fertilizer tests.

Why not pay them a visit?

Snow may stop traffic but it cannot stop a county agricultural agent when he wants to get anywhere. The spring thaw had set in—the going was very bad, but we got there, which is all in the day's work of a good county agent.

The soil in the drainage district south of Plover, Wisconsin, is mostly sandy loam, muck and peat. The muck soil is part of 50,000

acres in the Portage county drainage district. Drainage was started 22 years ago. Part of the area is now being farmed but not all of it has been taken up.

The farmers of the district have found that alfalfa grows and pays good profits. Although there were a few acres of alfalfa in the territory, the crop was really started in the district about three years ago when samples of alfalfa were sent out through the schools by County Agent Noble. Some of the boys grew alfalfa on small plots. It was a success. Then their fathers tried, and now many farmers have good alfalfa fields started on the sandy and muck soils. They are convinced that it has great possibilities on both soil types.

It is very important, however, that alfalfa be fed properly if it is to grow. Therefore, many farmers are buying lime, wood ashes, muriate of potash, and mixed fertilizers—analysis 0-12-12. Much of the lime is bought locally as residue from a paper mill. The lime was ready to spread in a number of fields, and heaps of wood ashes were noted in a number of barns.

James Isherwood, a leader in this crop improvement work, has made some careful and very interesting experiments with fertilizers, especially with their use on muck soils. These tests show what fertilizers paid and how much was applied.

"I had lots of visitors last year looking over my crops where I used potash," Mr. Isherwood told us. "Lots of my neighbors saw the results I had and they are going to use some this year."

During the visit, Mr. Isherwood presented some photographs and records of his tests. He said that when Mr. Noble suggested that he plant alfalfa, he thought that he had no room on his farm for it. He needed all of his fields for corn, potatoes, and other crops. But he has since changed his mind. His acreage of corn and potatoes has been cut down and he is very glad that he did it, because he now finds he makes just about as much profit on the potatoes as he did before and he still has 24 acres of alfalfa in addition on the sandy upland and three acres on the marsh. He uses his barnyard manure on the sandy soil together with commercial fertilizers and commercial fertilizers alone on the peat soils.

Whole field had manure — Center rows had no potash

Corn receiving no potash could not be harvested

The first picture which Mr. Isherwood showed us was of a crop of corn with two quite small rows in the center. The corn on either side had received 100 pounds of muriate of potash. It grew 8 to 12 feet in height while the corn on the two center rows receiving no potash was too small to cut. The potash cost $2.40 per acre.

Next he tried fertilizers on potatoes on the peat soil. Eight tons of stable manure were broadcast across the rows. Two hundred pounds of muriate of potash per acre were then applied in the row except to the center row. The center row received only manure. It produced 21 bushels of potatoes per acre while the fertilized part produced 155 bushels per acre of excellent quality potatoes. The potato crop was pictured in the second and third photographs which Mr. Isherwood gave us.

The next picture showed the results of another test that was made on "Rurals". Two hundred pounds of muriate of potash per

(*Turn to page* 53)

Potatoes—Left: 200 lbs. potash — Right: 8 T. manure, no potash

¶ Read about this new activity which has become a live subject in California

Orchard Judging

By W. P. Duruz

Pomologist, University of California

THERE are three classes of factors which determine success in fruit growing: (1) those involved in the orchard environment, (2) those which have to do with the inherent character of the trees themselves and (3) those determined by the grower in the cultural practices used.

For best results, the maintenance of an optimum combination of *all* these classes is necessary. That is to say, the production of profitable fruit crops is the result of the proper combination of many factors. Each of these factors may be likened to a link in a chain; thus we may consider soil moisture, spraying, pruning, thinning, etc., as links in the chain of fruit production. No chain is any stronger than its weakest link; so in the chain of fruit production if one factor is neglected the net profits are reduced.

The various orchard contests in California have brought out the importance of the right combination of these classes of factors. The winning orchards in these contests are those which have produced the largest yield and the best quality of fruit per unit, and which have the trees and orchard in the best condition at the end of the growing season. These orchards show the importance of a well balanced program of operations, each carried out in its proper relation to the orchard environment and to the trees themselves.

As a means of visualizing the relations of the three classes of factors mentioned a method of analysis is herein suggested. It has been found that its use will be of value in indicating the relative efficiency of orchards, the causes of failure to secure satisfactory yields, as well as ways and means of arriving at a fair method of estimating the real value of an orchard.

The individual tree is the ultimate unit of the orchard, a fact not sufficiently appreciated by the average grower, who usually thinks in terms of acres. The change in attitude from the acre to the tree as the unit is essential before analysis can be used to advantage.

The individual tree may be judged by means of the following score card:

Judging students examining a prize winning prune orchard

Factors	*Counts*
1. Size (For age and variety)..	16
2. Training (Framework and symmetry)	8
3. Pruning (Science and practice)	12
4. Vigor (Length growth, color of foliage, etc.).....	20
5. Fruitfulness (Past yields, prospects of crop, fruit buds, etc)	20
6. Health (Disease, insect and mechanical injury, frost, sunburn, etc.)	24
Total	100

After one has learned by practice how to judge individual trees it becomes fairly easy to apply this knowledge to *groups* of trees, or orchards. One quickly learns to note the uniformity or lack of uniformity as measured by an ideal tree as the unit.

The following score card has been used to advantage in this work:

Factors	*Counts*
1. Location, site and soil.	40
A. Location 10	
1. Climate (temperature, frosts, fog, wind, etc.)	
2. Transportation (roads, rail, water, distance)	
B. Site 15	
1. Water supply (reliability)	
2. Slope of land (air drainage)	
3. Exposure	
4. Windbreaks	
C. Soil 15	
1. Character, fertility, depth	
2. Ease of working	
II. Condition of trees....	40
1. Size 5	
2. Fruitfulness 10	
3. Vigor 10	
4. Health 15	
III. Condition of orchard..	20
A. Soil care 10	
1. Cultural practice	
2. Planting distance	
3. Irrigation practice	
B. Tree care 10	
1. Pruning	
2. Bracing	
3. Repairing	
4. Spraying	
5. Sanitation	
Total	100

(*Turn to page* 58)

Mr. Biedermann supervising treatment of a carload of approved Marquis wheat

Better Wheat

By

H. W. Biedermann

County Agent, Chadron, Nebraska

DAWES county, Nebraska, is staging a rigid campaign against smut in small grains especially wheat. According to reports from the Omaha, Nebraska, market, over 42 per cent of the wheat received on that market during 1925 was affected with stinking smut. In addition to the wheat being affected with smut, it is estimated that approximately 10 per cent of the wheat received on this market was mixed wheat.

Realizing that the farmers of Dawes county were losing a considerable amount of income annually due to the reduced price received for smutty and mixed wheat, a campaign to rid the wheat of smut and mixtures was launched at the annual mid-winter Farm Congress in January. At this meeting H. M. Bainer, Director of the Nebraska Wheat Improvement Association, P. H. Stewart, Extension Agronomist, College of Agriculture, Lincoln, and F. P. Manchester, Secretary of the Omaha Grain Exchange, gave excellent talks relative to the situation and on methods of improvement. Mr. Stewart also gave a practical demonstration on treating wheat with copper carbonate.

As a result of these meetings, the Chadron Flour Mills in cooperation with the Dawes County

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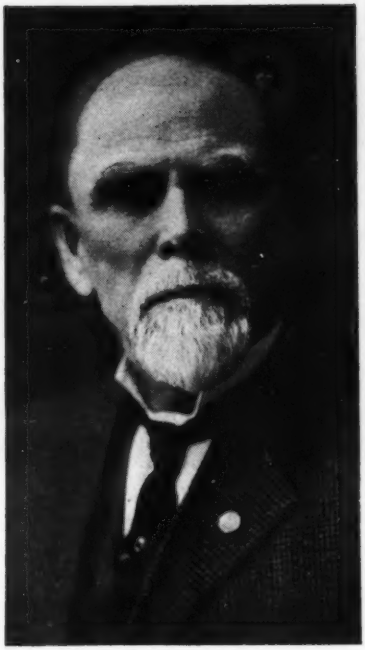
KANSAS' *Most Useful* CITIZEN

By
Ted Butlar



Foster Dwight Coburn

THROUGH its state board of agriculture, Kansas recently paid honor to whom honor was due. This great southwestern commonwealth paid deserved tribute to a man who devoted much of his life to the service of the state. The recipient of this testimonial of appreciation was Foster Dwight Coburn,—for twenty-two years secretary of the Kansas State Board of Agriculture.

Feeling that he could be of greater service to Kansas farming and farm folks by serving as the secretary of their agricultural board, he declined the appointment, extended him by the governor of his state, to become United States Senator. It is little wonder, then, that on his memorial tablet should appear these words: "In Tribute of Foster Dwight Coburn, Kansas' most useful citizen, whose genius was the wisdom of common sense."

Born upon a Wisconsin farm and going to Kansas at the age of twenty-one, Coburn first worked as a farm hand, later acquired a farm, then became editor of an agricultural paper from which he was advanced to the position, which for more than two decades, he held and in which he served his adopted state.

Complete fertilizer pays on tobacco

POTASH and

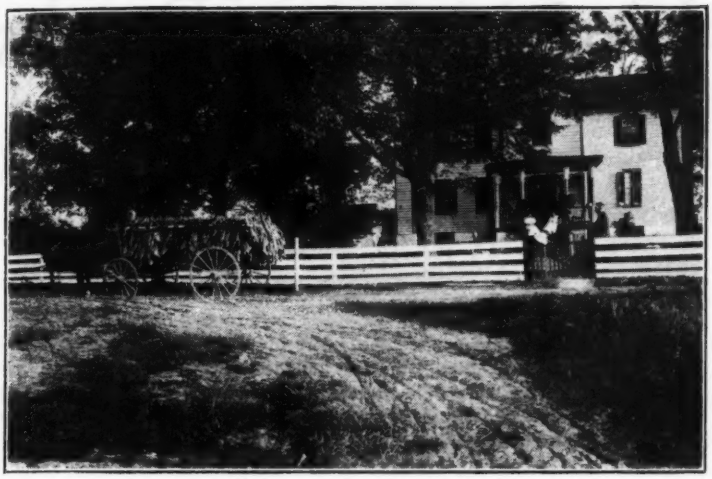
By T. K. Wolfe

Agronomist,
Virginia Agricultural Experiment Station

POTASH pays—not only pays but lends a handsome profit to the tobacco crop. It gives a polished and luxuriant appearance to tobacco which is the pride of every tobacco farmer. The ability to produce a good field of tobacco and to properly fit the product for market is born of long years of experience.

Science has aided the art of tobacco growing in a number of ways. Conspicuous among them, it has shown the dependence of the tobacco crop upon potash. The experiment stations in the tobacco districts have conducted a number of experiments to study the effects of fertilizers on tobacco and many valuable and worth while results have been obtained. In the furtherance of the knowledge on the subject the Virginia Experiment Station has issued Bulletin 242 on Experiments with Sun-cured Tobacco and Other Crops Grown in Rotation With It.

These fertilizer results show that for the most profitable production of sun-cured tobacco ammonia, phosphoric acid, and potash are all necessary. An application of 1,000 pounds per acre of an 8-3-3 fertilizer on heavy sun-cured tobacco soils and on light soils where stable manure has been applied pays handsomely. However,



A view on a prosperous tobacco farm

QUALITY

¶ *A winning team in success with tobacco*

on the light or sandy soils an application of 1,000 to 2,000 pounds of an 8-3-4 or an 8-4-5 fertilizer to the acre will give more profitable results.

The idea prevalent in some localities that heavy applications of fertilizers will cause tobacco to fire or burn on the hill, is not borne out by experimental results when a well-balanced fertilizer such as those previously named are used in as large amounts as one ton to the acre. "However, where certain incomplete fertilizers are not properly balanced, burning is often observed in adverse seasons."

The Virginia results show that phosphoric acid was the limiting element in profitable production of sun-cured tobacco followed in importance by ammonia. Although potash did not show as good results with yield as phosphoric acid and ammonia, it was very necessary for the production of good quality.

In tobacco quality is of equal importance with quantity. The value of potash in improving the quality of sun-cured tobacco is evident from the Virginia experiments. The results show that from the use of potash "the quality was so much improved that the tobacco produced on the complete fertilizer plat sold more than a cent a pound higher than that produced

(*Turn to page* 54)

Unbending Backs

By

V. T. Bartle

University of Wisconsin

THE modern farmer is facing out upon a new day. For several decades, the scientist, the inventor, and the manufacturer have been helping him transfer some of his heavier physical burdens. Steadily, he is becoming a director of greater power and a better business manager of a unit of the world's greatest food factory—the farm.

In the opinion of rural-minded leaders, the farm owner, for too long a time, has been thought of largely, as a tiller and toiler of the soil. For centuries his duties have been classed by the artist and the author as physical—guiding the plow with his steady, calloused hand; seeding the fields with a wide sweep of his brawny arm, and accomplishing each task with the strength of his own strong back.

Fathers and grandfathers still live to tell, as deeds of heroism, their tales of primitive farming methods before the advent of much of the modern labor-saving machinery. Many of the old-time methods were picturesque and so served as a source of inspiration to the poet and painter. But the vision of a greater agricultural future cannot be caught by these heroic or artistic conceptions; it demands, not the willing yielding to things as they have been, rather the unbending of backs like those in "The Man With the Hoe," and the lifting of burdens, similar to those pictured by Markham in the words:

"Bowed by the weight of centuries he leans
Upon his hoe and gazes on the ground,
The emptiness of ages in his face,
And on his back the burden of the world."

All will readily admit that "The Gleaners," "The Angelus," and "Potato Planting," by Millet, as well as many other paintings of rural life, have both beauty and meaning; but the modern version of farming, and living in the coun-

in FARMING

¶ This starts a remarkable series of stories on some of the things which science has done toward taking the aches and pains out of the world's oldest profession

try, must necessarily be quite different.

One has but to travel through the vast wheat fields of Montana, Nebraska or one of the Dakotas, during planting or harvesting time, to appreciate that there is an altogether different picture awaiting the pen of the poet and the brush of the artist. There, like great mechanical minds, the modern inventions of man break the sod, sow the seed, and harvest the myriad bundles of golden grain.

Everywhere a minimum expenditure of time and effort seem to be the aim. One marvels at the ease with which each task is accomplished! More and more the farmer sits at the wheel of agriculture, releasing and pressing brakes, shifting the levers, and, in it all, operating and guiding. He furnishes the direction; horses, or the motor, furnish the power.

But directing mechanical powers is only one phase of the busy life of the future farmer. He has been watching his neighbors, in the business world, succeed with well established and orderly merchandising practices; and now, he, too, intends to venture into business—the business of farming. Hereafter a portion of his busy days and weeks will be spent in keeping farm accounts and meeting, alike, his problems of marketing and production.

Quality will be his first consideration—a uniform, high quality product. His aim is to make it one upon which his consumers can depend and for which they will be willing to pay a better price. Then, by economizing carefully on the time and labor required in the production of each article, he expects to be able to market it in an efficient and orderly manner.

This is a better vision of the newer agriculture. By reducing his physical labor "The Man With the Hoe" will find time to straighten his back, to carry on his farming on a more businesslike basis, and to enjoy life more fully and richly.

Invention and Agriculture

WHAT is Agriculture? The European for hundreds of years regarded it as a mode of living. Americans have made it a science. Our farmers appreciate that it is a business. Nice technique employed by some specialists on modern farms make it appear an art.

But however it is considered, Thomas Edison's remark concerning the sufficiency of inventions is interesting indeed when applied to agriculture. For Americans, mechanical inventions have altered entirely the traditional concept of agriculture as a way of life. Mechanical inventions also have made agriculture a science. They have assisted more than most factors in making it a business. They are employed universally by those who regard agriculture as an art.

Yet it may be true that agriculture is, as Edison infers we all are, suffering from a surplus of inventions. The thousands of little, abandoned farms in New England are in part evidence of what big scale farming by the aid of machinery has done. Mechanical inventions have made possible the opening up of agricultural lands faster than they have been needed, so arable lands, once under cultivation, are obtainable cheaply anywhere. They have served to defeat the efforts of the woods dwellers, who, after spending years of time, which is money, clearing wooded acres have found land prices receding so their hoped for compensation vanished.

It is plain that our inventiveness has outrun our need for inventions in some respects. Yet it would be silly to infer that mechanical inventions have not been of immense net advantage to those engaged in agriculture, and that further perfections in devices will not bring more improvement in the status of agriculture as a whole. Even though the farmer suffers from his easily produced surplus and suffers because the vast areas of land subjected easily to the plow depress the market to his holdings, he would not care to go back to the land sowing and cradle stage of production, nor to the peasant stage of life.—Farmers' Dispatch.

Kentucky Blue Grass

¶ No. 2 of this series by Pennsylvania's authority

By J. W. White

Soil Research Chemist, Pennsylvania State College

THROUGHOUT Pennsylvania with the possible exception of the limestone valley section, may be found thousands of acres of idle farm land, a condition no doubt true in most of our eastern states. The great majority of this land, abandoned in some cases for many years, is found to be in a depleted condition. Continuous cropping without the return of mineral plant food is largely responsible for this economic waste.

In 1915 several members of the experiment station staff, including the author, visited many of these waste areas with the idea of locating permanent field experiments as a means of studying in an experimental way the most economic means of reclaiming these areas of abandoned farms.

Three locations were selected for our study, representative of the most extensive soil types of the State. On each soil type several different fertilizer and lime experiments were later started including permanent pasture and crop rotations.

Farmers at Bradford County Farmers' Day being urged to "Use the Land and Not Abuse It"

The first experiments of the series were started on DeKalb soil in 1916 on a field that had been abandoned for almost half a century. This field is known as the Snow Shoe Experiments located near the soft coal region of northern Centre county. The DeKalb soil includes 43 per cent of the total soil area of the State, embracing for the most part the rough mountain land section of central Pennsylvania.

The experiment field is typical of the poorer phase of the DeKalb mountain land derived mainly from hard sandstones and thin bedded platy shale. An idea of this extreme poverty-stricken soil may be gained from the yields on the untreated plots. During the first grain rotation plot 1 of field A gave per acre 2.3 bushels of corn, 5.0 bushels of oats, and .1 bushels of wheat. When clover was planted 680 pounds per acre of weeds were harvested.

IT is no wonder that the farmer left this field in disgust for he did not believe in fertilizers. He no doubt was the type of farmer that Baron von Liebig had in mind when in 1859 he wrote as follows: "The American farmer despoils his farm without the least attempt at methods in the process. When it ceases to yield him sufficiently abundant crops, he simply quits, and with his seed and plants, partakes himself to a fresh farm."

The story of the regeneration of this soil is a fitting tribute to scientific agriculture and recalls to the writer's mind another statement of von Liebig: "Science is conservative in her nature, not destructive. She does not reject the truths discovered by practice, but receives them; they are never disputed by her, but are examined and receive from her their proper import and further application."

In 1918 two additional field experiments were started, one on Volusia soil in Bradford county, and the other on Westmoreland soil in Washington county.

Volusia soil represents 19.4 per cent of the state soil area and has recently been subdivided into Canfield, Wooster, and Volusia soil types. This soil covers the northeastern and northwestern part of the state and includes the glaciated soil area. Just how long this soil remained in cold storage is a matter of conjecture, but we do know that the great ice caps played an important part in the destiny of this farming area. These soils are derived from a mixture of glacial till and decomposed materials from the underlying shale and sandstone.

The soils in this section are poorly drained and very acid, occupying a hilly region of a somewhat subdued topography including smooth contoured hills and narrow, steep-ridged valleys.

The experiment fields are located on an abandoned farm and unlike the DeKalb soils the land is potentially fertile. Excessive acidity has largely controlled the nature of vegetation.

Here a great dairy industry is found in spite of the poor condition of the pasture land. The possibilities for the improvement of the small areas of level grazing land and the creation and maintenance of highly productive Kentucky blue grass pastures on land now utilized to poor advantage for cultivated crops are shown from the results of the experiments discussed in a later paper.

The Westmoreland soils are found in the southwestern part of the State and include 8.5 per cent of the State soil area. This soil re-

(*Turn to page 55*)

Strawberry Culture

By T. J. Talbert

Horticulturist, University of Missouri

THE strawberry is more widely grown than any other kind of fruit. Wherever diversified agriculture is practiced, strawberries may be grown profitably. For more than six months each year strawberries may be found upon the principal markets of the country. The strawberry is the most valuable of the small fruits grown.

Every community can use locally the product of from one to ten acres of strawberries. This fruit is not grown as generally in the home vegetable garden as it should be. In most communities, therefore, there is an opportunity for some good grower to supply berries for local demand at remunerative prices.

According to the United States Department of Agriculture, the average yield of strawberries for the whole country is about 1,800 quarts per acre, valued at $150 to $200. There is probably no crop that will produce more dollars per acre than the strawberry; however, no one should attempt to get rich quick by planting too large an acreage the first year. In such a case failure would be almost certain.

The strawberry is an especially good crop for the home garden. It is adapted to a wide variety of

soils, and is comparatively free from injurious insect pests and plant diseases. The plants rarely require spraying. The crop is suited to the garden rotation, may be planted at a small initial cost, and will bring quick returns and large yields.

Soil and location will influence to some extent the time of harvest and the earliness of spring growth. In general, most varieties do better on light, sandy, gravelly or stony soils than on clay, heavy or wet soils. For best results, a well drained, fairly light, moisture holding, medium fertile soil is generally desired. A light, sandy or stony soil with a southern exposure will produce earlier fruit than a heavy, moist soil with a northern exposure. Also, low lands with poor air drainage are not as satisfactory as higher ground with good air drainage for strawberry production, because poor air drainage increases the liability of the plants to frost injury.

There are many varieties which are cosmopolitan and may be grown successfully over a wide area. Other varieties are restricted to certain sections or localities. Of the 1,800 or more varieties of strawberries, relatively few are adapted to any one combination of soil, climate, methods of growing or marketing conditions.

In the strawberry growing districts of the latitude of South Missouri, Northern Arkansas, Tennessee, and Kentucky, the leading commercial varieties in the order of their ripening are as follows: Klondike, Aroma and Gandy; while in North Missouri and similar regions the main varieties are: Dunlap, Warfield and some of the earlier sorts. The two leading commercial varieties are Aroma and Dunlap. Such sorts as Premier, Clyde, Bubach, and Gandy are favorites for table use. The Progressive and Superb are the leading everbearing varieties.

When the strawberry is desired from spring until fall, the grower may plant an extra early variety, a mid-season sort and an everbearing variety. The very early varieties will supply a moderate crop, the mid-season sorts the main crop, and the everbearing varieties fresh fruit for table use during late summer and early fall. For best results, the grower should limit his planting to a few varieties.

Some varieties are called pistillate or imperfect because of the plant's failure to produce the pollen necessary for fertilization, and they produce little or no fruit when planted alone. This difficulty may be overcome by planting every third or fourth row to a staminate or perfect variety such as Dunlap. All the varieties mentioned above, however, are staminate or perfect sorts and it is generally best to use such as one risk in production is eliminated.

EARLY spring planting is generally preferable to late summer or fall planting. Spring-set plants, except everbearing varieties, do not bear fruit until the following year. Plants set in the fall and grown under favorable conditions will bear a fair crop the following spring. For spring setting, the planting should be done as soon as the soil can be worked; while the latter part of August or September is usually best for fall planting.

The commercial and home growers generally prefer the matted row system of training. It is the simplest and easiest to establish and maintain. The runners are allowed to set at random in a row 18 to 20 inches wide. Some growers train the runners and space the plants while hoeing, but this is not required. The plow breaks off the runners and drags them

lengthwise, which will prevent the middles between the rows from filling with plants. If the runners are weighted lightly with soil, they will root more quickly.

Perhaps there is no more important factor in strawberry production than thorough and frequent stirring of the soil to make available plant food and to assist in the conservation of moisture. This applies to both the new and old fields.

Where the soil will grow good crops of corn or wheat, usually a profitable crop of strawberries can be produced without fertilization. Experimental work at the Agricultural Experiment Station at Columbia, Missouri and in the Ozark region indicates that on these soils acid phosphate at the rate of about 250 pounds per acre, is more often needed as a fertilizer than potash or nitrogen. It may be spread broadcast along the rows about ten days or two weeks after the plants are set, and worked in with hoe and cultivator; or it may be spread in the rows at planting time.

Under most conditions mulching is a profitable practice. Nevertheless, many of the Ozark strawberry producers procure profitable yields from their fields without mulching. This is particularly true where the surface of the soil is covered with stones, chert or flint rock, and there is only a small amount of soil near the surface. The stones appear to have an effect upon the soil similar to that of a straw mulch.

The mulch should generally be spread in the fall or early winter after the first hard freeze. A mulch from two to four inches in depth will conserve moisture, tend to prevent heaving of the soil and keep the ripe fruit clean at harvest time. The best material for this purpose is wheat straw. Rye straw, hay and leaves are frequently used, but these are generally not as satisfactory.

In many parts of the country strawberries may be grown successfully without a great deal of trouble from the attack of insect pests and fungous diseases. This will be particularly true where the strawberry field is rotated with field crops and where strong, healthy, vigorous plants are used for the setting of the field.

Picking strawberries using handy 6 and 8 quart carriers

16 *T. manure, 400 lbs. acid phosphate, 160 nitrate of soda, and 50 of muriate of potash on right compared with no treatment on left*

New Diets for

A review of Ohio Bulletin 377,
"Manures and Fertilizers for Truck Crops"

THE expansion of our cities and obvious encroachment upon the surrounding districts where market gardening has been developed brings to the grower of vegetables a real problem. Truck farming with the heavy annual application of manures and commercial fertilizers has produced highly productive soil areas, but many such areas must now be given up to city expansion. This means that less productive soil types must be brought under cultivation by the truck grower.

When our cities were small and before the advent of automobiles the truck farmer had no difficulty in buying adequate amounts of stable manure. This, however, is now out of the question. Automobiles make lots of noise and smoke but no manure.

A very practical problem is—Can satisfactory crops be grown on the newer, less fertile soil without the use of stable manure? Or in other words, can the soil fertility be maintained by the use of green manures, crop rotations and the proper use of commercial fertilizers?

As a result of nine years of intensive experimental work these important problems are answered in a forceful and practical manner by Professors J. H. Gourley and Roy Magruder, of the Ohio Agricultural Experiment Station, Wooster, Ohio, in Bulletin No.

The deleterious effect of a fresh straw mulch on early cabbage, left, as compared with no treatment on right. The straw was plowed under each year

Truck Crops

¶Here is Ohio's answer to a growing problem.

377—"Manures and Fertilizers for Truck Crops."

The results are extremely practical, very interesting and well worth studying.

The experiments were conducted at the Washington county experiment farm in the Marietta trucking district. The crops used were four—tomatoes, cucumbers, cabbage and sweet corn. Two series of plots—16 in each series—were used in this work. Each plot was 1/40 of an acre in size. Series A was designated as a soil fertility experiment and series B a soil improvement experiment.

On the 16 plots of series A, two tons per acre of finely ground raw limestone was spread over all the plots, fertilized and unfertilized alike. But on series B lime was applied to only certain individual plots. Some of the plots in each series received stable manure, chemical fertilizers and stable manure supplemented with chemicals. Where complete fertilizers were used on series A, the analysis was 4-10-4 and the amount applied per acre 1220 pounds. On series B the same analysis was used the highest application being 610 pounds. Cover crops were planted on series A after each truck crop was taken off, cowpeas after sweet corn, cabbage and tomatoes, rye after cucumbers and

(*Turn to page* 59)

Feeding Cotton

By E. B. Ferris

South Mississippi Experiment Station, Poplarville, Miss.

¶ *Cotton prefers some foods. Read what they are.*

WE have mentioned in several previous letters certain work started here in 1925 to more fully determine the fertilizer requirements of South Mississippi soils both as to the amounts of nitrogen, phosphorus and potash necessary as well as the sources from which at least the nitrogen and potash should be derived. In our last letter we discussed six different sources of nitrogen that were tested here and in this letter shall discuss briefly an experiment with five sources of potash.

We regret to say that we got no increases in yields of cotton by use of this potash and therefore the results are negative. However, the results actually obtained are largely in line with previous work done in the past here and at McNeill. On permanent plats set aside at Poplarville in 1919 for fertilizer work with cotton, we obtained no increases in yields due to the presence or absence of potash for two years or more, but after this time the plats receiving potash began to show marked increases as a result thereof.

On plats without potash from 1922 to 1924 the cotton rusted badly, while on plats with potash cotton leaves remained green throughout the season and we obtained material increases in the yields of cotton. So, in 1924 the most outstanding results of our work here with fertilizers under cotton was the way the potash plats outyielded those without it. This was true whether the source of potash was kainit, sulphate of potash or double sulphate of potash and magnesia, these three being the only carriers used.

EVEN in 1924 when the use of potash was showing so favorably on these permanent plats, cotton on newly cleared land without potash made just as well as it did on many of the older plats that had received potash. In 1925 we continued to plant a portion of the ground to cotton that had been planted in 1923 and 1924. This made the sixth year that these plats had been fertilized the same way, they having grown sweet potatoes for two years, corn for one year and cotton for three years. On these plats of old land we obtained material increases due to the addition of potash to nitrogen and phosphorus.

For instance, nitrogen and phosphorus alone in an 8-4-0 fertilizer increased the yield over the check

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CORN *or* Quack?

By C. D. Byrne

South Dakota State College

Robert Bullis

THIS is the story of a South Dakota club boy, Robert Bullis of Brookings county, who was given a field of six acres, badly infested with quack grass, yet he grew 50 bushels of corn to the acre in one of the driest years the state has known in a decade. His net profit was $164.61. Here is the way he told his experience in a report to Paul J. Scarbro, boys' and girls' club leader at South Dakota State College.

"MY project was six acres of corn. The land was plowed in the fall and part of it was plowed again in the spring to check a thick growth of quack grass which covered about two acres.

"After plowing it in the spring, I went over the whole field once and over the quack grass patch several times with a spring tooth harrow. The harrow brought a great many of the roots to the surface. These I gathered and burned.

"When I had burned the quack, I spread manure on the field at the rate of three tons per acre. Then I double-disked it to cut up the trash and lumps and to make the soil firm so the weed seeds would not germinate. When this operation was completed I left it until a few days before planting when I went over it with a spike tooth harrow to kill the young weeds.

"In a judging contest at the Brookings County Corn show last winter I won a half-bushel of

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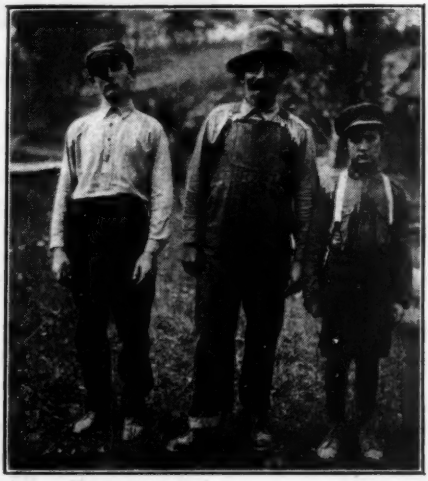
Getting Together for Profit

By
F. C. Gaylord
Horticulturist, Purdue University

FIFTEEN hundred extra tons of red ripe tomatoes for the canning company and $4,000 more hard earned silver dollars for the growers, higher yields per acre, less acres, more profits as well as satisfied contractors are only parts of the story of a Hoosier Canning Company that had foresight enough to go a little further than the law demands.

In 1911 the Tomato Products Company of Southern Indiana began operations. For the first few years contractors were plenty but yields were low, averaging around three tons per acre. Such yields tended toward poor quality and color and were unsatisfactory to both farmer and canning company. In 1918 the company, after three years of experimenting in cooperation with the Purdue Experiment Station, determined that well grown plants fertilized with a minimum of 500 pounds of a complete fertilizer, analyzing 2 per cent nitrogen, 12 per cent phosphoric acid and 6 per cent potash, would give average increases of from 5 to 7 tons an acre over unfertilized, poorly grown plants.



Ira V. Combs and his two sons—expert tomato growers

All these facts were presented to the growers but even though they saw the fields, few used the improved methods.

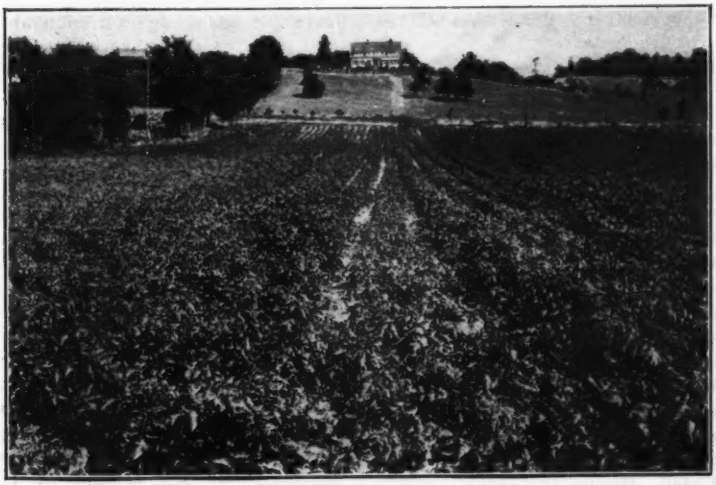
So in 1923 this company offered its growers a bonus of a dollar a ton in addition to regular contract prices for all who would agree to

use 500 pounds to the acre of 2-12-6. About 85 per cent of the growers used the fertilizer and as a result produced an average yield of 4.37 tons while those not using the 500 pounds produced an average yield of only 2.5 tons. Again in 1924 the company repeated the fertilizer bonus proposition. Two hundred and thirty-three growers used 500 pounds of 2-12-6 growing 665.5 acres with an average yield of 5.7 tons to the acre while 109 growers not using the 500 pounds grew 243.5 acres with an average yield of 3.5 tons to the acre. Thus the 233 growers using 500 pounds of 2-12-6 secured an average increase of 2.2 tons per acre over those not applying the fertilizer. This 2.2 tons gave them $26.40 more per acre, and besides they secured an average bonus of $5.70 each.

As far as the company is concerned results of the fertilizer bonus plan are highly satisfactory. Mr. Grosvenor said, "We have doubled the yields and improved the quality and color. During the past two years we have had the highest average yield ever recorded and the best color and quality. Many of our growers secured around 10 tons or more per acre in spite of what was considered an unfavorable season." The superintendent of one of the factories remarked, "I can always tell whether or not a grower has used fertilizer. If he has heavy and frequent deliveries you can just bet he's used the 500 pounds of 2-12-6."

NOT satisfied with the company officials' attitude toward the fertilizer bonus contract and tomato growing as a money crop, I decided to see just what the growers really thought of the whole arrangement. I traveled up and down over the hills, seeking out the truth from the growers. Typical of the answers were those from George Williard, who averaged 11.6 tons to the acre on a two-acre plot. "I grew more tomatoes since I used that 500 pounds of

(*Turn to page 56*)



This tomato seed field at Purdue University averaged more than 11 T. of red ripe tomatoes per A.

Minnesota

Pioneer of Progress

By W. P. Kirkwood

Editor, Minnesota College of Agriculture

EDITOR'S NOTE: *We are going to give our readers a visit to the state agricultural experiment stations. We want you to know what they are doing to better crops, want you to meet some of their leading agronomists, to see some of their campus and experimental farms. The editors are pleased to introduce this series with a trip to the "Gopher" state—widely known as a source of new varieties of crops for the Northwest.*

WITH all of the talk of the agricultural depression of the last five years, the fact that agriculture in the United States has made mighty strides should not be lost sight of. Evidence of the progress made is seen in figures for Minnesota as a typical midwestern state. According to the United States census, the agricultural industry in Minnesota in 1890 represented, in lands, buildings, implements and other equipment, and livestock, a total investment of $414,701,626. Today Minnesota's total investment in agriculture is more than $4,000,000,000.

All through the years of the state's astonishing agricultural progress its experiment station has pioneered the way. The station began its efforts with demonstrations in sound practices. Then it turned more and more to creative work, to the development of field and of fruit crops specially adapted to climate and soils, and to the solution of problems relating to crop rotations, soil needs, weed control, plant disease prevention, drainage, land-clearing, livestock and livestock products, animal health, insect pests, farm marketing and all the rest.

In all of its various lines of endeavor, it has made rich contributions to the prosperity of the state.

> It matters little how well a variety promises to yield unless all the product can be harvested.

One of the Minnesota station's early contributors to the welfare of the state was Minnesota No. 169 wheat. This yielded, on the average, three bushels more to the acre than the varieties commonly grown by Minnesota farmers. At the time this wheat came into favor, the wheat acreage of Minnesota was about 5,000,000. Assuming that the new wheat was grown on one-fourth of that acreage, or 1,250,000 acres, the added annual

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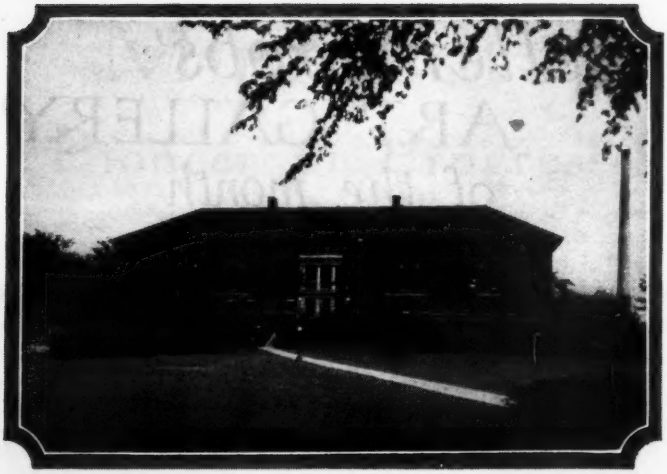
Better Crops' ART GALLERY *of the month*

W. C. COFFEY

Director of the Minnesota Experiment Station and Dean of the Department of Agriculture of the University of Minnesota, which includes the College of Agriculture, Forestry, and Home Economics and four Schools of Agriculture giving technical training in practical farming and in home-making



ADMINISTRATION BUILDING

The Minnesota Agricultural Experiment Station University Farm, St. Paul.

F. J. ALWAY

Head of Soils Division, Minnesota Experiment Station. His discoveries of the soil needs of the state have added enormously to the potential wealth of Minnesota, and, indeed, to the state's actual wealth.

ANDREW BOSS

Vice-Director, Minnesota Experiment Station and head of its Division of Agronomy and Farm Management. Under his supervision the Minnesota station has given largely to varieties of field crops adapted to northwestern conditions.

Secretary of Agriculture Jardine receives the champion garden growers of New York.

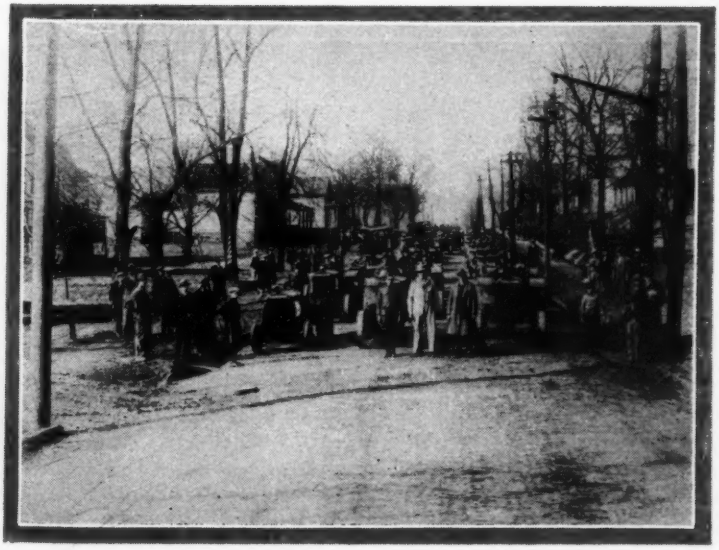
The first and oldest apple tree ever planted in the Northwest. This tree, which is 100 years old, is the most historic tree in the state of Washington.
(Photo from Ewing Galloway, N. Y.)

An art figure being hung on the agriculture building in Philadelphia in preparation for the Sesqui-Centennial celebration, part of which will be devoted to art.

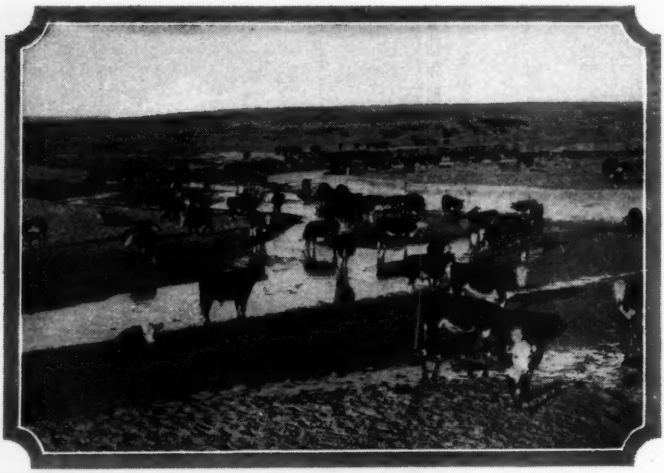
Justices Willis Van Deventer and Pierce Butler at the cornstalk entrance to the United States Supreme Court, Washington, D. C.

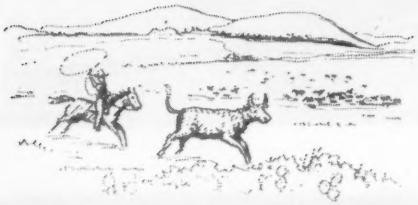
New York City boys taking examinations for scholarships for a three-year course in scientific agriculture at the National Farm School, Doyleston, Pa. The money for the scholarship is raised by prominent New York business and professional men.

Crops look pretty good—the world pretty rosy to this old farmer enjoying the sunshine under the first straw hat of spring.



A shipment of $35,000 worth of tractors and farm implements recently delivered to farmers of McLean county, Illinois, in one day in exchange for corn at the rate of $1 per bushel. Each tractor is being driven by its new owner.





In the southwest cattle country. These steak-making Herefords are a long call from the Texas longhorns which grazed these lands in the early 70's.

This Seattle, Washington pup and rooster are sworn enemies. Nearly every day finds them in an encounter which usually ends in a draw.

The Editors Talk

The task of an investigator requires for its success the toughness of a soldier, the temper of a saint and the training of a scholar.—Humphrey Davy.

THE other day we visited a large farm in the west, unique in its way because the owners employed an agricultural adviser whose work it was to cheapen the cost of production. It was this man's work to confer with the State agricultural authorities, conduct fertilizer experiments, study and improve the drainage system, organize the most effective means of crop protection, find the best varieties and strains of seeds and study any other factors calculated to run the farm on the most efficient basis.

FARM ADVISERS

This man is paid solely by the owners. He is saving the farm money. Other large farms in the Southwest devoted to breeding cotton also employ experts along the same lines. The number of such farms is increasing.

We are beginning to realize that managing land for crop production is a business. Involved in successful management is the right relationship of a number of units—one must fit the other. Every factor affecting production must operate at maximum efficiency. The difference between profit and loss is often the total of small differences—not big ones.

Operating in large units there is all the opportunity and all the work any one man wants to control these units and factors to produce efficiency and success. Forward-looking business farmers recognize this and employ experts on single farms.

But when such men are employed by the state or county, we expect one man to look after the interests of a whole county.

Geographically he is expected to spread himself. Intellectually he is expected to spread himself. He must know every agricultural subject involved as farm accounts, crop production, stock

raising, soil management, in fact be in touch with everything that can happen on a large number of farms.

In many cases it is doubtless true that by the geographical-intellectual spread the adviser almost eliminates himself or is in grave danger of so doing. If accomplishment is achieved, it is often at the cost of the county adviser's own free time.

In judging the work of such men is it fair to do so seriously until they are given a fairer chance to accomplish something? Until their duties and territory are narrowed down?

In Europe, one of the most important developments of recent years is the plan by which one adviser is employed by a small number of farms, say 20 or 30. Such an adviser can more thoroughly devote his time to the solution of farm problems and produce effective results.

We average about one county agricultural agent to 1200 farms.

The county agents and extension forces are among the hardest working group of men in our national agriculture. They are accomplishing much. They are putting into productive practice much of our laboratory and experimental findings.

But they are working under the handicap of covering too much territory and too many fields. It is not always the cheapest plan that produces the most profitable results. From an agricultural business viewpoint, the whole organization needs careful and thorough study.

"Thou mak'st my teeming hen to lay her egg each day"—Robert Herrick.

AT the time our Puritan forefathers landed at Plymouth, a poet was living in the English county of Devonshire. His name was Robert Herrick.

"THE TEEMING HEN"

Herrick was a Royalist, a true Cavalier. He loved his king and the life at court. He did not get along well with the Puritans, and so he kept closely to his small house, tended to the poor, wrote poetry, and lived to a ripe old age.

One of his poems is a thanksgiving for his house.

"A little house, whose humble roof is weather-proof;
Under the spars of which I lie
Both soft and dry."

He gave thanks for all the small house contained,

"Low is my porch, as is my fate, both void of state,"

for his little buttery and little bin, for the sticks of thorn or briar, for the purslane, and mess of watercress. And for his land that the bushel sown gave twice ten for one, and for the teeming hen—that laid her egg each day.

From two Puritans of the period we have inherited far nobler, greater poems. But for these simple things of home and land, Robert Herrick gave thanks. They were written in the Seventeenth century. Their spirit is still an example for the Twentieth.

The most important agricultural tool is a pencil for making calculations.

FERTILIZER PROGRESS

COMMERCIAL fertilizer in the amount of 7,272,665 tons was used in the United States in 1924.

This tonnage represents progress. This manufacture of commercial fertilizer materials in soluble forms is a modern development, one of the most essential to the prosperity of our National Agriculture and present standard of living.

The first fertilizer factories were built to supply a most urgent need, the most urgent that can exist, the necessity for larger crop yields. That was in 1842. The average yield of wheat in England at that time was 23 bushels per acre. It was insufficient. Cities were growing, land values rising, the population increasing. It was vitally necessary to increase the yields of wheat, turnips and other crops, in order to make the higher priced land pay and to maintain cheap food supplies.

Bones had been used for this purpose. They were partially effective. So Europe was searched for bones. Liebig in his laboratory at Giessen was very outspoken about this trade in bones. He protested "England is robbing all other countries of their fertility. Already in her eagerness for bones she has turned up the battlefields of Leipzig, and Waterloo, and of the Crimea."

Thus bones and also guano, fish, lime and marl were found insufficient to maintain yields. To fill the urgent demand, Lawes at Rothamsted discovered how to make acid phosphate by treating insoluble mineral phosphates with sulphuric acid. He took out a patent, built a factory and started the manufacture of acid phosphate, only 84 years ago.

Liebig suggested the same process. Later, similar methods were used by Pratt in South Carolina.

Such was the beginning of the manufacture of fertilizers. Acid phosphate and later potash supplemented the use of guano, then in use in the southern states. Consumption has grown. In 1924 there were 3,250,498 tons of acid phosphate used in the United States.

In 1860 Liebig discovered the value of potash as an essential plant nutrient. In 1924, 1,227,067 tons of potash salts were used in the world's agriculture. A growth of 62 years.

Basic slag was introduced 46 years ago.

The manufacture of soluble nitrogenous fertilizers from the air is of recent origin. Scientific research in all branches of manufacture and uses is in progress. The end is not in sight, in fact only a beginning has been made.

Thus the industry was founded in response to urgent needs. It is modern. It has grown rapidly; the problems are many, chiefly the result of rapid growth which is confusion—increased in this country because of the great diversity of soils, climatic conditions, crops and farming systems, under which fertilizers are used.

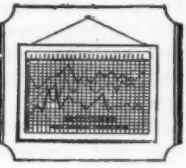
The problems rest on the basic fact that farmers must make a profit on their investments in fertilizers if consumption is to increase. If the farmer loses, the industry loses. If he profits, the industry profits.

Does each farmer make a profit on his fertilizer expenditures? This requirement means that there is a vast amount of work to be done. But progress is being made. Looking back on what has been accomplished, shall we not accomplish more in the future?

The factors that impelled the foundation of the manufacturing industry are more potent today than 60 or 80 years ago. Our needs are greater, our resources greater. Over a long time period the consumption of fertilizers must increase.

The greatest needs at present are, an impartial survey and analysis of all data affecting the use of fertilizers. This would provide a fundamental basis of correlated facts and result in less confusion. Other needs are a simplification of analyses recommended, more field and other experiments supplemented by shorter tests to determine local soil and crop needs, less pressure on research workers for quick results, closer cooperation between sales and experimental forces and the cultivation of a long time viewpoint.

AGRICULTURAL DEVELOPMENTS



By P. M. Farmer

South African Farmers Coming

Ignoring the fact that the U. S. is never free from the shouts of those who think that American agriculture is in a bad way, a group of 50 farmers of South Africa are planning on coming here in 1927 to learn something of the producing and marketing methods of our farmers and those of the Canadians. The Minister of Agriculture and the Chief of the Division of Marketing and Economics of the Union of South Africa will accompany them. It is said that most of their interest will be in marketing. The U. S. Department of Agriculture and the Department of Commerce are cooperating in making plans for the visit.

Potash Controls Cotton Rust

Certain soils in North Carolina lacking in potash and organic matter are liable to produce cotton damaged by what is known as rust, and the damage is frequently great. Disease organisms and insects have nothing to do with the trouble which, according to G. W. Fant of the Experiment Station, may be prevented by using fertilizer containing 200 pounds of kainit or 50 pounds of muriate of potash to the acre. It is also recommended that a crop rotation be practiced to add organic matter to the soil. Cotton rust may be distinguished from wilt, which occurs in the eastern part of the State, by cutting into the stem of the plant. Those with wilt have a blackened streak within the stem. The only way to fight wilt is with resistant varieties. The "rusted" plants have mottled leaves that later turn reddish brown and drop, leaving only the skeleton. Sometimes there is a 50 per cent loss from rust.

Plants Have Their Troubles

If plants could give voice to their woes the air would be filled with sighs and lamentations even when the winds were stilled. For plants are greatly afflicted. The diseases alone, without considering insect pests and injuries the result of accident, according to the plant pathologist of the Department of Agriculture, figure up an appalling total. Thirty-nine separate and distinct diseases afflict the rose, and its thorns and beauty are no defense. The apple may have one or more of 66 pathological disturbances, more than 40 are known to attack the tomato, wheat is heir to 31, the oak tree to 52, and we grow big crops of corn in the face of 28 diseases that may attack the plant.

36 Years—38 Bushels

Since 1890 the potato yield in Pennsylvania has increased from 70 bushels to the acre to 108 bushels, a gain of 38 bushels, or more than 50 per cent. Last year nearly 40 farmers in the State made the grade in the 400-bushel potato club which has been running for several years. Credit for the increase in the State is given

by the State Department of Agriculture to improved seed strains and varieties, control of diseases and insects by the use of disease-free seed and better spraying methods and equipment, better care and management, and more fertilization.

German Government Loans to Farmers

The German Reichstag has passed a bill providing for a loan of thirty million marks ($7,150,000) to a grain trading company made up of farmers, fertilizer syndicates and others, according to a report from the American Agricultural Commissioner at Berlin. The company will study ways and means to make agriculture more profitable, one of the principal means in mind being the stabilization of grain prices through buying, storing and selling German grain.

Sesqui in June

The Sesquicentennial Exposition, which will open in Philadelphia the first of June, will contain many exhibits of interest to the farmer. The U. S. Department of Agriculture is preparing exhibits showing the work of most of its bureaus and offices. It will show results of its laboratory and field work of interest not only to the farmer and the scientist, but also to the manufacturer and the general public.

New Apples

Six new varieties of apples have been developed at the New York State Agricultural Experiment Station and are being offered to fruit growers in the State for trial. Each of them is said to have some points of superiority over those of the same season now grown. Their names are Lodi, Medina, Orleans, Milton, Sweet Delicious, and Sweet McIntosh. The famous Delicious apple does not attain sufficient size in New York State and attempts have been made to get some of its qualities, along with size, in new varieties. Medina and Orleans are the results of crosses between Deacon Jones and Delicious. Sweet Delicious is another obtained the same way.

Jean! Jean! Make a Machine!

At a demonstration of fertilizer-distributing machines held at Clemson College, S. C., recently, J. T. McAlister, associate professor of agricultural engineering, said "one of the crying needs of the farmer is machinery that will perform four or five operations in one. We need machines that will open the furrow, distribute fertilizer, plant seed, and cover the seed in one trip over the ground." He said there is also a need for implements of similar efficiency for cultivating and harvesting crops. In the course of his talk he stressed need for great accuracy in fertilizer distributers, and for a capacious hopper on machines with the center of gravity low.

Would Concentrate Garbage

Garbage from city homes has long been known as good hog feed and an excellent supplement to grain. The principal difficulties in using it have been its bulk and poor keeping qualities. At the Oklahoma A. & M. College they are trying to develop a practical method for handling this valuable waste which, if successful, will be a boon to cities as well as to the farmers. The best quality garbage is collected, dried, and ground. Chemical and nutritional tests are to be made.

Foreign and International Agriculture

The purpose of this department is to help us understand the scientific, practical, and industrial agriculture of other countries and the international developments which result. The editor believes that such knowledge is now of the greatest importance in our agricultural prosperity. Every care is taken to insure accuracy—both of facts and their interpretation.

How the Britisher Raises Spuds

By H. R. Cox

Agronomist, New Jersey State Agricultural College

THOSE who have a leaning for farm statistics will tell you that the average yield of potatoes in Great Britain over a period of years has been about 180 bushels per acre. In the same period the average yield in the United States has been about 98 bushels. The reasons for this great difference in yield are interesting to observe and may be suggestive of certain desirable changes in the future on the part of our American growers.

The British farmer follows a well balanced system of farming. Besides potatoes he usually has one or more cash crops. It is also quite general to have a considerable amount of livestock on the farm, beef cattle especially. Wheat is an important cash crop, and less frequently such crops as fruit, sugar beets, and seed crops of turnips, mangels and mustard. The British potato grower does not have all his eggs in one basket. He is vitally interested in the potato crop and strives for better results with it, but this does not prevent him from growing large yields of wheat, oats and roots, or from turning off a sleek bunch of steers or fat hogs.

The most intensive potato section of Great Britain is the fen country of Lincolnshire. Originally a large part of the fen district was marsh land with islands here and there upon which towns sprang up. The city of Ely where the great cathedral is located was originally built on an island in the swamp. The first important drainage operations were started by Dutch engineers some 500 years ago along the approved Dutch lines of ditching and dyking. Today this section is known as the Garden of England. The land is worth from $300 to $700 an acre. Much of it is owned in large holdings. Farms of 500 acres are common and some of them consist of 2,000 acres or more. This is a region of bonanza farming. I met a number of men who had started with nothing and had accumulated 1,000 to 2,000 acres. A tract of 2,000 acres worth $500 an acre makes the owner thereof a millionaire, if he has it clear. Some of these large land holders had a rather difficult time of it for years; then came the war with its high prices for potatoes, wheat and everything else the farmer had to sell. During the war and for several years after these land owners entrenched themselves so strongly that the sheriff will not catch many of them.

I visited one man in the fen

country who operates 1,400 acres, 800 of which he owns and the rest he rents. He had in 1925 a total of 300 acres in potatoes, 262 in wheat, 48 in barley, 79 in oats, 125 in peas, 40 in beans 135 in turnip and mangel seed, 7 in caraway seed, 76 in sugar beets, 120 in hay and 1½ in alfalfa. He also had 110 head of beef cattle, 206 hogs and 60 horses. I am giving a fairly complete picture of this farm as it is typical of most of the farms in the fen country.

This man stated that over a period of years his average yield of potatoes has been 335 bushels per acre. He has raised as high as 550 bushels per acre as the average of an entire field. As to his other crops, on most of his land with a favorable season he gets 60 bushels of wheat per acre, barley 64, oats 76, beans 52 and sugar beets 16 tons. So you see why it is possible for a man to raise small grain on land worth 500 dollars an acre.

Again, I visited a farmer in Scotland, fairly typical of his district, who has 510 acres. Of these, potatoes occupy 90, wheat 90, oats 120, barley 40, turnips 40 and hay 120. There are about 230 beef cattle fattened on this farm every year. This man stated that he had averaged 315 bushels of potatoes an acre for a number of years past.

The British potato grower is much interested in the seed question. The best seed is raised in Scotland where there are many growers specializing in seed potatoes. It is quite common for the English grower to get a certain amount of Scotch seed every year, the product of which is used to plant his entire acreage the following year. There is a careful system of seed certification in Scotland and about 60,000 acres are inspected every year. In the past, the principal concern has been to check up to trueness to variety, largely for the reason that some varieties are immune to wart disease and some are not. In addition to this, however, the inspection now takes into account the degeneration diseases, and no lot of potatoes having these diseases in any appreciable amount can be certified as seed.

The names of the potato varieties raised in Great Britain sound as strange to the American as our own varieties do to the Briton. Our standard varieties, such as Green Mountain, Irish Cobbler, Raleigh, Carmen and Rural are unknown to the potato growers of Great Britain. Their varieties include King Edward, Sharp's Express, Kerr's Pink, Iron Victory, Field Marshal, Great Scot and Epicure. The latter is an early variety. The rest are second early and late varieties. Most of these are immune to wart and have attained their popularity partly on account of this immunity.

It is almost universal in Great

A chitting house *The Owner's home* *Wheat—60 bu. per A.*

Britain to use whole potatoes for seed, although not tubers of the larger size. Also, it is customary to plant in rows 27 to 28 inches apart. Because of these two facts the amount of seed used is much larger than in our country, from 25 to 35 bushels per acre being the usual amount. With early potatoes it is customary to use larger seed pieces and more seed per acre than with the late kinds. This is for the purpose of pushing the early potatoes for rapid growth so the crop will bring high prices on the early market. In the early potato section of Scotland it is common to use 50 bushels of seed per acre and some growers use as high as 75 bushels per acre.

It is a fair question to ask whether some of our American potato growers cannot use larger quantities of seed to more advantage than they do. The rate of planting in this country generally is from 12 to 15 bushels per acre. Some tests recently conducted at the New Jersey Experiment Station would seem to indicate that heavier planting would be a profitable practice. This heavier planting might take the form of larger seed pieces or closer spacing. Although the New Jersey experiments indicated that pieces a little larger than average might well be used, a still greater increase in yield was made by placing the pieces closer together in the row. It might not be profitable for every grower in this country to increase his rate of planting; but for the grower who is following good practices in all other respects, heavier planting is a practice that he might well consider.

Fertilizers are known as artificial manures or "artificials" in Britain. The potato growers use fertilizers plentifully. The county agent in the fen district is recommending the use of about 1,700 pounds per acre of a mixture analyzing 7.5 per cent ammonia, 12 per cent phosphoric acid and 10 per cent potash, and many of the most progressive farmers are using about that quantity and that formula. This is for land that is rotated in small grains, grass and other crops and to which no stable manure is applied to the potato crop. Many fields are liberally manured for potatoes and in such cases the amount of fertilizer used is only about 700 to 900 pounds to the acre.

During the winter seed potatoes are taken from the pits and put in shallow trays about 3 feet long and holding about 40 pounds of tubers. The filled trays are put into unheated glass houses to force the sprouts. At planting time the seed tubers have sprouts on them which are hard and green and about a half inch or an inch long. The glass building is called the "chitting house" and the seed with the sprouts is known as "chitted seed." In planting two workmen

Digging with spinner *Picking* *Screening and sacking*

carry a tray, one on each side of the tray, and drop the seed tubers in the open and fertilized furrows. Not all seed potatoes are chitted, but the practice is growing and all progressive farmers do as much of it as time and their facilities will permit. The advantages of chitting are that it hastens the "come up" and largely eliminates the planting of weak seed.

Early potatoes are not sprayed as a rule, but spraying is common with the late crop. The principal disease is late blight and bordeaux mixture is the material used. The growers in the fen country generally dust instead of spray, using a copper lime dust. Spraying or dusting begins about July 1 when the plants are about a foot and a half high and two or three applications are made. It does not seem to be necessary to put an insecticide in the spray material. Fortunately for the British growers the Colorado beetle and the flea beetle are unknown to them.

THERE are various methods used in the Kingdom of Britain for harvesting potatoes. I observed one interesting method in the fen country. It consisted of the use of a spinner, which is a horse drawn implement. This tool has a revolving frame in the rear with six sets of teeth approximately a foot long which dig into the soil, pushing the potato plants, tubers, tops and all, to the right. Pickers then come along and pick up the tubers into baskets. The baskets are dumped into sieves to shake out the dirt and small potatoes. The tubers are then emptied from the sieve into the sack.

Fortunately for the British farmer his markets will take all the potatoes he can grow and then reach out to Ireland and the Continent for more potatoes. Great Britain is an industrial nation and, consequently, a food importing nation. Its markets, therefore, are always hungry for home grown products. This gives a certain advantage to the British farmer whose foreign competitors must pay heavier freight charges than he does. This advantage is largely offset, however, by the fact that he has to compete with industry for labor so that his producing costs are higher than his foreign competitors. A topic very much in the minds of the farmers of Britain is that they should have protection by the placing of a tariff on agricultural products coming in from abroad. As a majority of the people of Britain are consumers rather than producers, it is not likely that the farmers will get their wish.

For several years during the late war and immediately after the potato was a very profitable crop to British farmers. Many of them paid off their mortgages in that period. The year 1922 was a disastrous one for the potato growers, but since that year the crop has paid its way. One grower told me that in 1924 the average price he received for his late potatoes was $1.23 per bushel. In the bad year of 1922 his average price was 22 cents a bushel.

There is in Great Britain, as in the United States, an apparent tendency toward a diminishing consumption of potatoes per capita, but not from the same causes as in the United States. In Great Britain an important cause of this is the increasing cost of coal. The housewife will boil potatoes if she is going to build a fire to cook meat or other foods, but she is not so likely as formerly to make a fire for the sole purpose of boiling potatoes. This was the opinion expressed by one of the keenest observers I met in Scotland, and there is probably much truth in it.

REVIEWS

This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, Crops, Crop Diseases, and Insects. A file of this department of BETTER CROPS would provide a complete index covering all publications from these sources on the particular subjects named.

The work of the Experiment Stations is the basis on which much of our agricultural progress is founded. It is, therefore, both interesting and valuable to have the work of the Experiment Stations for the year 1924 embodied in one well arranged bulletin of 114 pages. The work is comprehensive, including such subjects as the trends of Station work, projects undertaken, the results, publications and statistics of the Stations. The bulletin can be obtained from the United States Department of Agriculture. The title is "Work and Expenditures of the Agricultural Experiment Stations, 1924."

Fertilizers

More fertilizer is used on cotton than on any other crop. Fertilizer experiments on cotton are, therefore, very necessary and of vital importance. The Mississippi Agricultural Experiment Station has recently published in Circular No. 63 the results of such experiments at the South Mississippi Branch Experiment Station. The author is E. B. Ferris.

Also in Bulletin No. 230, the results of similar experiments at the Central Station are given. This bulletin also gives the results of studies on different varieties of cotton.

Michigan Agricultural Experiment Station in February, 1925, Circular No. 53, gives the analysis of standard fertilizers suitable for Michigan soils and crop conditions. These analyses are set forth in a very complete and detailed table. It includes both mineral and muck soils.

The Michigan Station has also published in the Quarterly Bulletin for February, 1926, a very practical discussion on the effect of fertilization on the quality of muck crops, by Professors Harmer and Weidemann. We are particularly glad to note that such subjects as the marketability of potatoes and the size and number per hill have been studied. Also the effect of phosphoric acid and potash on the quality of beets, carrots, onions, parsnips and sugar beets. This is a step in the right direction. Such work is badly needed. The results show that with nearly every crop studied, the application of phosphoric acid alone on muck soils has produced little or no increase in yield or in sugar content. The following significant remark is added: "In other words, the results indicate that for the production of a crop of high sugar content, a fertilizer mixture high in potash content should be used." The Quarterly Bulletin also contains many interesting articles on subjects other than fertilizers.

Nitrate nitrogen is undoubtedly a limiting factor on many soils. The results of experiments on the effect of cultivation on the nitrate content of the field soil are given in Bulletin No. 205, published by the College of Agriculture, Arkansas. Dan T. Gray is the author.

"Fertilizer and Fertilizer Material," Alabama Department of Agriculture and Industries, Montgomery, Alabama, Department Bulletin No. 7, Fiscal Year

1924-25. *J. M. Moore, Commissioner.*

"Commercial Fertilizers, Agricultural Minerals," Department of Agriculture, State of California, Special Publication No. 61 1925. Firman Thompson, assisted by Geo. E. Colby, W. G. Marshall, John W. Elmore, Roy P. Tucker, contribution from Division of Chemistry, Geo. P. Gray, Chief.

"Annual Report of the State Chemist of Florida" for the year ending December 31, 1925, Department of Agriculture, Tallahassee Florida, Volume 35, Number 1. Nathan Mayo, Commissioner of Agriculture, R. E. Rose, State Chemist.

"Soils and Fertilizers," Florida Quarterly Bulletin of the Department of Agriculture, Tallahassee, Florida, Volume 36, Number 3, January, 1926. Nathan Mayo, Commission of Agriculture.

"Analyses of Commercial Fertilizers and Ground Bone; Analyses of Agricultural Lime 1925," New Jersey Agricultural Experiment Stations, Department of Chemistry, New Brunswick, New Jersey, Bulletin 426, December, 1925.

Soils

A very valuable and interesting bulletin of 68 pages has recently been published by the United States Department of Agriculture, entitled "A Study of the Value of Crop Rotation in Relation to Soil Productivity," by W. W. Weir. The bulletin reviews the results of the classic experiments at Rothamsted and many of the long-continued experiments in the United States, among which are studies of experimental plots in Missouri, Wooster and Germantown, Ohio. It is shown that crop rotation is a vital factor in increasing crop yields.

"Drainage on the Farm," University of California, College of Agriculture, Agricultural Experiment Station, Berkeley California, Circular 304, March, 1926. Walter W. Weir.

Crops

The March issue of the American Potato Journal, published by the Potato Association of America, is called the Seed Potato Number. Excellent articles by authorities deal with "The Value of Good Seed Potatoes," "Pennsylvania's 400 Bushel Potato Club," "The Potato Situation," and matters of certification, seed treatment, surveys and laws on certified seed production.

Other interesting crop bulletins received during the month include:

"Composition of Arizona Forages, with Comparative Data," University of Arizona, College of Agriculture, Agricultural Experiment Station, Tucson, Arizona, Bulletin No. 113, December 1, 1925. C. N. Catlin.

"The Pecan in Arizona" University of Arizona, College of Agriculture, Agricultural Experiment Station, Tucson, Arizona, No. 154, December 15, 1925. A. F. Kinnison.

"Making Money from Potatoes," Connecticut Agricultural College Extension Service, Storrs Conn., Bulletin No. 95, March, 1926. Albert E. Wilkinson, Vegetable Specialist.

"Growing Early Plants," Connecticut Agricultural College Extension Service, Storrs, Conn. Bulletin No. 91, November, 1925. Albert E. Wilkinson, Vegetable Specialist.

"Yellow Pickle in Greenhouse Cucumbers" Massachusetts Agricultural Experiment Station, Amherst, Massachusetts, Bulletin No. 225, December, 1925. Victor A. Tiedjens.

"Research Service to the Massachusetts Apple Industry," Massachusetts Agricultural Experiment Station, Amherst, Massachusetts, Bulletin No. 226 January, 1926.

"The Connecticut Valley Onion Industry," Massachusetts Agricultural Experiment Station, Amherst, Massachusetts, Bulletin No. 227, February, 1926.

"Value of Certified Irish Seed Potato Seed in Mississippi" Mississippi Agricultural Experiment Station, A. & M. College, Mississippi, Circular 60, December, 1925. H. H. Wedgworth, Inspector State Plant Board, C. B. Anders, Assistant Director, Raymond Branch Station.

"Preliminary Agricultural Program for Western North Carolina" North Carolina State College of Agriculture and Engineering, State College Station, Raleigh, North Carolina. Extension Circular No. 157, March, 1926.

"Fruit Varieties in Ohio. 1," Ohio Agricultural Experiment Station, Wooster, Ohio, Bulletin 391, February 1926. J. H. Gourley, C. W. Ellenwood.

"The Bimonthly Bulletin," Ohio Agricultural Experiment Station, Wooster, Ohio, Vol. XI, No. 2, March-April 1926, Whole No. 119.

"Rotation and Hogging Off Experiments with Field Peas," State College of Washington, Agricultural Experiment Station, Pullman, Washington, Bulletin No. 198, February, 1926. E. G. Schafer, R. T. Smith.

"Growing Sweet Corn," Extension Service of the College of Agriculture, The University of Wisconsin, Madison, Wisconsin. Circular 196, March, 1926. E. D. Holden.

"Sugar Beets in Wisconsin," Extension Service of the College of Agriculture The University of Wisconsin, Madison, Wisconsin, Circular 1925, March, 1926. A. H. Wright.

Economics

The source and amount of farm income are important subjects to the farmer. These matters have been carefully studied by the survey method in Tama county, Iowa,

by Clifford C. Taylor and Edward B. Hurd. The results are published in Research Bulletin No. 88 of the Agricultural Experiment Station of Iowa. The bulletin is divided into main parts, the type of farming and financial analysis. The work is a further interest to economics as a study in the multiple correlation method of analyzing data. An interesting discussion is given regarding the efficacy of this method. The results show that the farms of Tama county "are fairly prosperous under ordinary economic conditions."

Another very interesting Research Bulletin is No. 89 published in November, 1925, at Ames, Iowa, entitled "A Partial Correlation Analysis of Farm Organization and Management Data from Warren county, Iowa." In this study the net effect of 14 factors were measured as affecting the profits of 231 farms in Warren county in 1921. The author is C. W. Crickman.

Diseases

"Seed Treatment for the Control of Irish Potato Scab," Mississippi Agricultural Experiment Station, A. & M. College, Mississippi, Circular 61, December, 1925. H. H. Wedgworth, Inspector State Plant Board, C. B. Anders, Assistant Director Raymond Branch Station.

Insects

"Early Summer Dispersion of Boll Weevil with Special Reference to Dusting." University of Arkansas, College of Agriculture, Agricultural Experiment Station, Fayetteville, Arkansas, Bulletin No. 204, February 1926. Dan T. Gray, Director, Dwight Isely, Associate Entomologist.

"Poisoned Bait for the Control of Cutworms," Mississippi Agricultural Experiment Station, A. & M. College, Mississippi, Circular 62, December, 1925. H. H. Wedgworth, Inspector State Plant Board, C. B. Anders, Assistant Director Raymond Branch Station.

"Spraying Program for the Orchard and Fruit Garden," Ohio Agricultural Experiment Station, Wooster, Ohio, Bulletin 393, March, 1926. H. C. Young, J. S. Houser, F. H. Ballou.

"The Control of the Striped Cucumber Beetle," University of Tennessee, Agricultural Experiment Station, Knoxville, Tennessee, Circular No. 1, February, 1926. S. Marcovitch.

"The Corn Ear Worm on Tomato," University of Tennessee, Agricultural Experiment Station, Knoxville, Tennessee, Bulletin No. 133 December, 1925. S. Marcovitch, S. A. Robert.

"Supplementary Investigations of the Fluosilicates as Insecticides, with Observations on the Effect of Heat and Drouth on the Mexican Bean Beetle," University of Tennessee, Agricultural Experiment Station, Knoxville, Tennessee, Bulletin No. 134, January, 1926. S. Marcovitch.

"Investigations on Oil Sprays," State College of Washington, Agricultural Experiment Station, Pullman, Washington, Divisions of Entomology and Chemistry, Bulletin No. 197, February, 1926. A. L. Melander, A. Spuler, E. L. Green.

"Poisoned Baits for Strawberry Root Weevil," State College of Washington Agricultural Experiment Station, Pullman, Washington, Division of Entomology and Soology, Bulletin No. 199, February, 1926. A. L. Melander, A. Spuler.

* * *

Missouri Legumes

The place that legumes play in making good corn crops was forcibly demonstrated at the Carroll County Missouri corn show and sale, when eight of the ten highest yields reported in the five-acre contest were found to have been grown on legume sod. The other two were grown on timothy and blue grass sod. Sweet clover sod was turned under on five of these fields, while red clover sod was plowed under on the other three.

The highest yield reported for the county was 117.3 bushels to the acre grown by Herman Engelking. The average of the ten highest yields was 95 bushels.

* * *

Four animals went to a circus—a duck, a pig, a frog and a skunk. All of them got in except one. The duck had a bill, the pig had four quarters, and the frog had a greenback, but the skunk only had a scent, and that was a bad one.

Minnesota

From page 28)

return to Minnesota farmers was close to $3,000,000, and this continued for several years, until No. 169 was displaced by Marquis which originated in Canada.

The Minnesota station was also instrumental in pushing the corn-belt northward from the Iowa border until two-thirds of Minnesota was included. This was the fruit of studies and trials which developed two new varieties of corn—Minnesota No. 13 and Minnesota No. 23. The former matured earlier than the varieties grown in Iowa and enabled farmers in southern Minnesota to grow corn with comparative certainty that it would mature before killing fall frosts. Minnesota No. 23 matured still earlier and could be grown with safety even up in the Red River valley.

COINCIDENT with work in improving field crops was that in building up the state's dairy industry. This took two forms: The encouragement of cooperative creamery enterprises and the working out of standard rations for dairy cattle on the basis of milk and butterfat production. As a result, Minnesota today has among its 800 creameries, some 650 which are cooperative, and an annual total sale of dairy products amounting to about $150,000,000. Besides, Minnesota's feeding standards have been adopted far and wide.

Successful dairy farming involved the growing of legumes—alfalfa, sweet clover, soybeans. Consequently, the Minnesota station staff turned its attention to such crops. Members of the staff were instrumental in promoting a wide interest in Grimm alfalfa, a winter hardy variety brought over from Germany by Wendelin Grimm, an immigrant farmer of Carver county. Because of their success with this variety, Minnesota farmers are rapidly extending their alfalfa acreage. Sweet clover and soybeans are also rapidly gaining in favor.

More recent contributions by the field crops specialists of the Minnesota station include Gopher oats, a stiff-strawed, high-yielding variety which is rapidly displacing other varieties throughout the state; Minsturdi and Velvet barley, the latter a smooth-awned variety which promises to take high rank, contributing much to dairy farming in northern Minnesota where barley is a substitute for corn in the dairy ration; Winona and Chippewa flax, wilt-resistant varieties, and Minturki winter wheat, a winter-hardy variety likely to encourage winter wheat-growing for its larger yields and more even distribution of the year's farm labor.

Progress has been reported, also, in efforts to breed varieties of wheat resistant to black stem rust, which in recent years has taken terrible toll of northwestern wheat crops.

THAT Minnesota has become one of the leading potato states of the country, particularly in the production of certified seed stock which is being bought at a premium through the South and even in the East, has also been the outcome of the work of the Minnesota central station and its substations.

The work of the station's crop specialists early disclosed the need of widespread soil studies. Soil needs have now been pretty well mapped. Perhaps the most striking achievement has been in the discovery that on sandy lands, extending northward from St. Paul

The biggest problem which the plant breeders of the Northwest have to meet is to develop a spring wheat resistant to black stem rust.

and Minneapolis to Bemidji and eastward, alfalfa can be grown with success if the soil is first treated with lime. This makes a large region a potential dairy country, and dairy farming is developing rapidly.

ANOTHER achievement almost as striking has come from careful study of Minnesota's large peat areas. The state has some 7,000,000 acres of peat soils. The soils division of the experiment station has delved into these and experimented here and there, until now it is able to give a very clear idea of the peat soil needs in any part of the state. The information already available, it is believed, will go far toward the reclamation of the state's peat land resources. Already large dairy and cropping enterprises have become established on peat lands.

Fruits are becoming increasingly profitable crops in Minnesota as a result of extensive fruit-breeding experiments. The Latham raspberry, bred by the Minnesota station specialists, is a winter hardy variety, the fruit being large and firm and of delicious flavor. Raspberry growing in Minnesota, before the invention of the Latham, was a difficult job. Most varieties, or practically all, had to be covered up in winter to prevent winterkilling. The Latham needs no such attention. It is said that the returns from this one output has more than paid for the Minnesota station's fruit-breeding farm and its maintenance.

In addition, the fruit-breeders of the station have given to the state a whole list of wonderful plums, crosses between native fruits and the large plums of California, the trees resistant to Minnesota's severe winters and the fruits of delicious quality and flavor, large in size and rich in color. Apples and strawberries are other contributions in the line of fruits.

Experiments in beef-cattle raising, swine production, poultry keeping, and beekeeping have given an impetus to intensive activity in all four fields. The growth of the immense packing industries of South St. Paul testify to the increasing interest among Minnesota farmers in beef cattle and hogs. The Minnesota station's cattle feeding and swine feeding days are always largely attended.

THE Minnesota station has at present about 160 projects under way. The growth in the demands upon the station and the varied conditions in the different parts of the state have necessitated the expansion of the station and the organization of numerous branches.

The first step toward the creation of a Minnesota Experiment

The fundamental problem for the corn farmer is that of securing for each community the variety or varieties which will yield the greatest number of bushels per acre, and yet mature corn before frost.

station was taken by the legislature in 1868, only six years after the history-making Indian massacre in southern Minnesota, when Minnesota was still regarded as on the far frontier. That year the legislature authorized the board of regents of the University of Minnesota to spend $8,500 for the purchase of land and for experimental work. A tract adjoining the University campus on the outskirts of Minneapolis was obtained and made ready for experimental work, under the direction of Charles Y. Lacy. Professor Lacy continued in charge until 1880, when he withdrew, and on January 1, 1881, Edward D. Porter was placed in control. Professor Porter did not find the site which had been chosen suitable, and on his recommendation a new site, that now known as University Farm, about three miles from the other, was purchased.

PROFESSOR Porter served as director until 1889, when N. W. McLain succeeded him. Professor McLain resigned in 1891, and was followed by Clinton D. Smith of Cornell University, who remained in charge until 1893, when he became director of the Michigan station. W. M. Liggett succeeded Professor Smith.

Director Liggett resigned on account of ill health in 1907, and was succeeded by E. W. Randall, who served until December, 1908, and was succeeded by J. W. Olsen, at the time state superintendent of public instruction. In 1910, Mr. Olsen was followed by Dr. A. F. Woods of the United States Department of Agriculture. He resigned July, 1917, to become president of Maryland State University, and was followed in turn by R. W. Thatcher, at that time head of the division of biochemistry of the station. In July, 1921, Director Thatcher resigned to become director of the New York station at Geneva, and W. C. Coffey of the University of Illinois was appointed his successor.

THE Minnesota Experiment Station system now includes the central station, University Farm, St. Paul, with 456 acres, on which are 27 major and 31 minor buildings used for experiment station, agricultural college, and agricultural school purposes; the Northwest branch station at Crookston, where there is also a school of agriculture, with 550 acres and 11 major and 14 minor buildings; the North Central branch station at Grand Rapids, where another school is soon to be opened, with 445 acres and 6 major and 10 minor buildings; the Northeast branch station at Duluth, with 5 major and 9 minor structures; the West Central branch station at Morris, where there is still another school of agriculture, with 355 acres and 10 major and 10 minor buildings; the southeastern Minnesota branch station at Waseca, with 246 acres and 5 major and 10 minor buildings; the fruit-breeding farm, near Lake Minnetonka, with 112 acres, and a forest experiment station at Cloquet, with 2,662 acres.

IN addition, under the direction of the station are numerous experimental and demonstration fields scattered over the state to work out special regional problems, particularly in relation to soil needs.

The various branch stations and the experimental fields and demonstration plots throughout the state are all supervised from the

central station. The system offers admirable opportunity for the solution of the various regional problems and for the study of the adaptation of such solutions to other parts of the state.

THE College of Agriculture, Forestry and Home Economics at the central station, along with a central school of agriculture for the technical training of boys and girls for farm and farm home lives, and the two other schools at Crookston and Morris, give opportunity to spread the information derived through experiment and investigation. But other means are used. At the college is a completely organized extension division, with a large staff of specialists who carry information directly from the station to every part of the state, working with a corps of county and home demonstration agents whose work is also directed from the college.

Moreover, the college also maintains a director of short courses, under whose supervision is held every year some 15 or more short courses, to which farmers and others from all parts of the state come for periods of intensive study. A Farmers' and Home Makers' Week every January brings in from 1,500 to 2,000 men and women to study farm and home problems. A creamery operators' short course furnishes training for buttermakers who supply the demand for trained help in Minnesota's 800 or more creameries. Furthermore, the college and station make free use of bulletins and the press in disseminating the knowledge acquired through experiment and through study of the work done at other stations.

H. K. Hayes

Head of the Plant-Breeding Section of the Division of Agronomy and Farm Management, Minnesota Experiment Station. It was under his direction that Gopher oats, Velvet barley, and other contributions to western agriculture were bred and made available to farmers.

The worth of the Minnesota station's work has been recognized by the people of the state and the work has been generally supported by the state legislature. The new work in agricultural economics, home economics, and rural sociology under the Purnell Act, is likely to attract still wider attention. This work will be carried on in coordination with the work of other stations throughout the country.

Hardy roots are as necessary as hardy tops for successful growth in Minnesota.

Corn or Quack

(*From page 25*)

Murdock seed corn and later I bought another bushel, paying four dollars for it. I ear-tested it all and planted only the ears which tested 100 per cent strong. I adjusted the planter to drop four kernels in a hill. The planting was done on May 15 and four days later the field was dragged to kill the weeds and give the corn a head start. At the time of planting the moisture was about two inches below the surface of the ground so I planted the corn three inches deep to make sure there would be enough moisture for the seed to germinate.

"WHEN I started cultivating June 4, the corn was about two inches high except in the thickest parts of the quack patches. The quack grass in these spots was so thick that I broke two singletrees and a neck-yoke going through.

"I used the surface cultivator and found that it did much better work than a shovel cultivator. A shovel cultivator digs deep, turning up the soil to dry out and also cutting the corn roots while a surface cultivator merely turns over the surface soil and cuts off the weeds without bothering the corn roots.

"The fact that the surface cultivator does not turn the soil up to dry out was especially valuable this year as there was very little rainfall. The first rain which did any good came on June 1. Up to July 6 there were five other heavy rains. After July 6 until the end of the growing season there was less than a quarter of an inch of rain. This came in small showers so did not do much good.

"It was a difficult task to adjust the cultivator properly but when this was adjusted the quality of the work done more than made up for the time spent in adjusting it. Another boy and I demonstrated the adjustment of the surface cultivator at the state fair this fall and took second prize.

"I cultivated the corn four times, twice each way. The quack grass is now nearly killed out.

"Murdock is a late maturing corn but mine matured as soon as most early varieties. I picked 15 bushels of seed, using the early field selection method, and strung it up with double strings. To save time in gathering, I put a large box on a stoneboat and hitched a horse to it, driving between the rows and picking two rows at a time.

"On September 22 I began to pick the bulk of the crop. I had the crop all picked before there was a hard frost. The yield was 50 bushels per acre; out of this I saved 35 bushels for seed. This gave me 50 bushels of seed and 250 bushels of market corn. My net gain on the six acres was $164.61.

"MY corn work taught me many things. Some of them are the value of good seed, the value of the surface cultivator and that the best way to kill weeds is to keep down the top growth. I intend to raise corn as a part of my project next year. I believe that I can do a great deal better because I know more about it. I am going to plant it on the same piece of ground in order to finish the quack grass. I have it pretty well under control now. Next year I can produce my corn with less labor."

Ask the Soil

(*From page 7*)

acre were used. The result was a gain over the unfertilized rows of 109 bushels of potatoes per acre at a cost of $4.50 for potash. This test was made on a newer piece of land.

Fertilizers were tried on oats—125 pounds of muriate of potash per acre. Alfalfa was seeded in the oats. A yield of 53 bushels per acre was obtained where the fertilizer was used and the alfalfa seeded very nicely.

The last picture was of a garden on muck soil.

TO sum up—on the muck soils for alfalfa and potatoes, 200 pounds muriate of potash gave a very good profit. On oats and corn 100 to 125 pounds muriate of potash were used. Mr. Isherwood uses potash alone on the peat soils, but after a few years intends to use phosphate with the potash to keep a better balanced fertilizer. For the present, however, he considers that potash is sufficient.

He finds the manure much more profitable on crops on the sandy upland. As Mr. Isherwood points out, when potash is applied to the oats on the muck soil it produces much more straw which is applied in the manure on the sandy upland. Thus potash on the muck soil helps to build up the sandy soil also.

On alfalfa grown on the upland about eight tons of manure per acre is used with 75 pounds of muriate of potash and 50 pounds of an 0-12-12. A number of farmers on the upland are applying 150 pounds of potash and from 75 to 100 pounds of the treble superphosphate per acre for alfalfa seeding. Some are also using the 0-12-12 mixture.

THE farmers attribute their success to the help of County Agent Noble and to the branch experiment station at Coddington which for some years has been making experiments with fertilizers. Coddington is a branch experiment

Truck crops on peat fertilizer with potash

farm of the Wisconsin Agricultural Experiment Station. Professor A. R. Albert is in charge.

The success in fertilizing and finding the most profitable crops and fertilizers for these soils is a very good example of team work between county agents, farmers, and the local experiment station.

EDITOR'S NOTE: *There is a great difference in muck soils. Local fertilizer and cultural tests should be made as much as possible, and where this is not done, the best experimental work in the state should be studied before starting cropping systems or fertilizer practices.*

* * *

Potash and Quality

(*From page* 13)

on the plat where no potash was used."

IN summarizing the fertilizer results, "It may be observed that for the production of good quality sun-cured tobacco a liberal application of nitrogen is necessary to promote a steady and vigorous growth and to fill the leaf in maturing; a liberal amount of phosphoric acid is necessary to hasten growth and maturity and to add bright color in ripening and curing; and a liberal amount of potash is not of less importance for on this depends largely the smooth, fine, silky and elastic qualities of the leaf.

"The healthy, clean appearance in the field is also greatly improved by potash. On our plats on which potash is eliminated the tobacco has a rough dull appearance both in the field and in the barn when compared with that of other plats where potash has been applied."

Surely these results indicate that the purchase price of potash, when the potash is properly used, on tobacco will return with manifold interest.

The question often arises which is the better source of potash for tobacco, muriate of potash or sulphate of potash? Burning tests show that the burning quality of tobacco produced from the use of sulphate is better than that produced from the use of muriate. However, the results from use of these two potash salts on the yield and selling price of tobacco are meager.

The Virginia Experiment Station has recently conducted tests to determine the latter point. Five years' results with dark tobacco showed that the average increase in yield in favor of the muriate was 58 pounds per acre and the increase in selling price was $12.12. The tobacco produced from the use of each of these potash salts sold for an average price per pound of 22.3 cents. Two-years' tests with bright tobacco gave results similar to those secured with dark tobacco.

THESE results indicate that muriate of potash is certainly as good as, if not superior to, sulphate of potash so far as yield per acre and selling price is concerned. However, since sulphate of potash tobacco burns better than muriate it would seem that a mixture of one-half muriate and one-half sulphate of potash would be best for tobacco.

Kentucky Blue Grass

(*From page* 18)

sembles the DeKalb though more fertile and formed in part from limestone fragments. The land is of a rolling to hilly topography with some relatively level uplands.

Kentucky blue grass at one time grew well on these hillsides and still limited areas of good blue grass may be found. Here also the spoliation system has been the practice resulting in the depletion of the pasture land until today the blue grass is largely replaced by weeds and grass of less economic value.

The experiment fields are located near the town of Washington on abandoned land typical of the soil type.

In each area described erosion is severe, made possible by deforestation and later depletion of the grass-covered hillsides.

THE pasture experiments include plots one-tenth acre in size treated with various combinations of commercial fertilizers, lime and manure. Space will not permit a detailed description of the various treatments and the final results secured. We will therefore confine our discussions to three important plots; namely, those treated with acid phosphate; acid phosphate and muriate of potash; and acid phosphate, muriate of potash, and nitrate of soda. In each case the soils were treated with pulverized limestone in sufficient amounts to insure a liberal supply and thus prevent lime from becoming a limiting factor.

The fertilizers are applied biennially at the following rate in pounds per acre: Phosphoric acid, 65; potash (K_2O) 50; nitrogen 48.

THE pastures were mowed in the early summer when the blue grass was in late bloom. The field cured hay was then raked and weighed. The second growth of blue grass was not harvested each year. It was difficult to secure accurate yields of the subsequent growth, due to the difficulty of cutting and raking the relatively short grass. However, during the progress of the studies, the later growth was harvested several times by use of the mowing machine, also by clipping representative areas with lawn shears. The data thus secured showed that the second growth was 54 per cent of that secured in the first cutting.

Data secured from somewhat similar studies at the Cornell Experiment Station (Bul. 424)

showed that the growth of Kentucky blue grass during the second half of the season was 44 per cent of that produced during the spring and early summer. The yields given include the first cutting plus 40 per cent added for the estimated second growth. The Cornell studies also show that blue grass under pasture conditions, that is, cut at five periods, gave 13 per cent greater yields than when cut as meadow hay.

Before and after harvest, the plots were carefully studied and the nature and proportion of vegetation present were estimated. The green weight of pasture grass is computed on the basis of 76.2 per cent water. In computing the green weight, the air-dry hay was assumed to contain 20 per cent water. (Field wt. x .80 ÷ 23.8 x 100).

EDITOR'S NOTE: *Next month Professor White discusses the adaptability and nutritive value of Kentucky blue grass.*

* * *

Getting Together for Profit

(*From page 27*)

2-12-6 and fertilized your way. When I started out I decided I'd try just as hard as I could to make the company pay for that fertilizer. Yes sir, and I did it, too! Since I tried out this fertilizer I have done better, I have given them better care.

"I CAN'T raise more than 35 bushels of corn to an acre, I'll tell you 35 bushels is a right smart yield, most of our tomato ground won't raise 20 bushels of corn to the acre. I picked the good spots—the best on the farm—I broke ground in March, worked it early, and planted the first part of June. I gave them good care throughout the season—weeds and tomatoes, I find, can't give best results on the same ground the same year. The piece of soil that averaged that 11½ tons was worn out soil 10 years ago. It had grown up in sassafras, was cleared and pastured and planted to corn twice then I planted to tomatoes."

Ernest Adams, another grower, averaged 10 tons in 1923 and 11 tons in 1924 on three acres. "I never raised a crop until last year and this year. I know that fertilizer doubled my yields,—it sure does the business. I wouldn't grow tomatoes any more without that 500 pounds of 2-12-6. My neighbor, David Bledscoe, just kept hauling and hauling. I don't know where they came from but he averaged 10 tons to the acre.

"I have found that tomatoes are the best paying crop on the farm, and I certainly am going to keep on growing tomatoes. I've found that it pays to keep the ground covered in winter with rye, follow crop with soybeans and cowpeas. I rotate, use clover, rye, soybeans and manure. I follow tomatoes with wheat or rye, that always pays."

Going on down the road I met Charlie Beaty who averaged 12.75 on top of another hill. On four acres he grew 50 tons of tomatoes and secured $665. "Better than

anything else," said Beaty. "I would just as leave work with tomatoes as anything. They certainly do pay."

JAMES JONES, another farmer, averaged 15 tons on 2¼ acres. "Yes sir! that 500 pounds of 2-12-6 paid me. I can't get anything that will do what tomatoes will on this soil. I like the crop, too. I raise my own plants with the exception of a few I bought. I use rich soil, plant seed thin and cover beds with canvas. My plants come up thin and grow robust. I used a cut clover sod, turned this under in the spring, and plowed the field seven inches deep early. I think I want to plow deep for tomatoes. I drilled in 500 pounds of 2-12-6 and set plants the first of June. I like to set last of May. I found that good plants, good soil, liberal fertilizer and clean frequent shallow cultivation hits the spot. I shallow cultivated twice a week. I set all my plants by hand. I just waited until a damp spell, then we went right to it. I certainly am strong for tomatoes."

AT every farm I asked, "Do you know anyone that didn't use fertilizer?" But, so well have Grosvenor and Braxton driven home the gospel of "500 pounds of 2-12-6 farmer tried" that no one knew where the unfertilized tomato farmers lived. Everyone seemed well pleased with the crop and wished to keep on growing it.

I finally came to Ira Combs, who with his two boys Charlie and Elza, grew 39 tons on three acres of land that looked like the top of Lookout Mountain. I found the soil at the top of the ridge clay soil which had timothy and

(*Turn to page* 58)

Jeffisms

Love may not make the world go round, but it certainly can make your head spin.

* * *

There are no short cuts to experience.

* * *

Some reformers aren't content with making us walk the straight and narrow path; they want us to walk a tight-rope.

* * *

Things never look so black after a good substantial meal.

* * *

A good politician is a man who can say less than his opponent in more words.

* * *

A man is never so whipped as when he's lonesome.

* * *

Money and deviltry will make a smart set anywhere.

* * *

We can seldom have what we want because what we want is generally what we don't have.

Jeff

Getting Together for Profit

(*From page 57*)

clover turned under about eight inches deep, then thoroughly prepared and drilled with the proverbial "500 pounds of 2-12-6." I found that they too had grown their own plants on a heavily fertilized plot, had protected them by canvas, had planted seeds thin, and had planted real plants which had been given the best of care.

Many Indiana canners tried out the fertilizer bonus system last year with equal success. Typical of results secured was that of Greenfield Packing Company where $2,000 in extra cash was distributed for the use of 500 pounds of 2-12-6 per acre. Growers using the fertilizer averaged 6.59 tons per acre, while those using no fertilizer averaged only 3.65 tons.

Thus it has been demonstrated that high grade seed, good plants, liberal fertilizer, and good culture throughout the growing season will make 10 tons of tomatoes an acre possible in every section. May the day be near at hand when closer cooperation between canner and farmer will bring about these desirable results.

* * *

Orchard Judging

(*From page 9*)

By the use of this method of analysis together with tree and orchard records a grower can furnish himself with helpful information as to the relative efficiency of his orchard and ways and means for increasing his yields.

Before making a purchase, the prospective buyer of an orchard will be well repaid by looking over several of the districts that are producing the kinds of fruit he desires. He can then assure himself, within reasonable limits, that in general characteristics the district is suitable for his purpose. The best test of the fruit growing possibilities of any district is the success that has already been attained there. It is often on this account that land in proven fruit districts sells at a much higher price than in districts not so long established. With the above factors in mind the prospective buyer may balance the qualities of an orchard against the price asked and then decide as to whether it is a wise investment.

* * *

Better Wheat

(*From page 10*)

Farm Bureau and County Agent Biedermann shipped in a carload of approved Marquis wheat (spring) from Glasgow, Valley county, Montana. This wheat was secured through the county agent at that place.

Upon arrival this wheat was treated for smut with copper carbonate with the machine shown in the accompanying illustration. It was sacked direct from the machine and distributed in 5, 10, and 15, and 20 bushel lots, to approximately 60 Dawes county farmers who sowed it upon clean land and will keep it pure for seed the following year. It is expected that enough seed will be raised to sow practically the entire wheat acreage in Dawes county, in 1927.

In addition to this work several wheat and corn variety tests are also being conducted in the county to determine the varieties best adapted to the county.

New Diets for Truck Crop

(*From page 23*)

also after the cowpeas following frost. Series B also received a treatment of cover crops.

DID the chemical fertilizers and cover crops profitably replace the use of stable manure? The answer is—Yes.

One of the most striking results of the work shows that production can be maintained by the use of chemical fertilizers, ground limestone and cover crops without manure. Further than that, the net returns from the use of chemicals were nearly double that from the use of manure. This does not, of course, indicate that organic matter should be dispensed with. Its maintenance is always of vital importance.

The fertilizer treatment that gave the highest profit in series A was 1220 pounds per acre of a 4-10-4. This was more profitable than 16 tons of stable manure. The organic matter was supplied by a cover crop planted after each truck crop was off.

Series B confirmed these results. Six hundred and ten pounds of a 4-10-4 was more profitable than 16 tons of manure on all crops except tomatoes. The stable manure was most valuable on cucumbers and tomatoes.

WAS the use of the raw, ground limestone necessary and profitable? The answer is again—Yes. The limestone was profitable on all crops. On cabbage it returned a profit of 1200 per cent. Used with 16 tons of manure it was profitable on all crops except sweet corn, and especially high on cucumbers.

This answers two of the most important objects of the experimental work, but there is a great deal of detailed information on other points, especially the result of supplementing manure with chemicals. Generally speaking, manure gave larger yields on some crops than the chemicals, but the higher costs reduced the profits below the treatment with chemical fertilizers. Manure was also slower in maturing some crops.

Other results showed that on tomatoes, 1220 pounds of a 4-10-4 was more profitable than 610 pounds of the same analysis. Fresh straw mulch was unprofitable in this experiment. Manure was worth about $2 per ton, spread on the field. Four hundred pounds of acid phosphate added to 16 tons of stable manure increased both the yield and profit on each crop except sweet corn.

Among the most important results of the experimental work the relatively high production and low cost of increase from the proper applications of chemical fertilizers was the outstanding result.

The general plan of this experiment is very practical and the results are so comprehensive that we feel every truck grower interested in greater profits should read this bulletin. Write for Bulletin 377, Ohio Experiment Station, Wooster, Ohio.

* * *

"Liza, you remind me fo' all the world of brown sugar." "How come, Sam?" "You am so sweet and so unrefined.—*Exchange.*

Feeding Cotton

(*From page 24*)

468 pounds per acre, while nitrogen, phosphorus and potash in the proportions required to make an 8-4-4 fertilizer gave an increase of 684 pounds over the check. We make these statements before giving our 1925 result because we really believe that, taken alone, these 1925 results may prove misleading, especially with reference to potash as they were conducted on land which, while uniform in composition, had not grown cotton in several years and whose history as to previous fertilization we have no means of determining.

THIS work with potash was done on eight plats in three series, making a total of 24 plats. The first, fifth and eighth plat in each series were checks, that is, they received no potash. All plats had received 300 pounds acid phosphate and 150 pounds of nitrate of soda per acre and the plats mentioned received no potash. The other plats received at the rate of 25 pounds of actual potash per acre supplied from five different sources; sulphate of potash, muriate of potash, kainit, sulphate of potash and magnesia and kemfert.

The cotton from these 24 plats has been picked and weighed and the following figures, calculated in pounds of seed cotton per acre, give the averages in these several tests. It should be understood that the check, or no potash plat, represents the average production of nine different plats, while the production from the five forms of potash are the averages of three tests each. These results are as follows: no potash, 1,506 pounds; 50 pounds sulphate of potash, 1,450 pounds; 50 pounds muriate of potash, 1,550 pounds; 50 pounds kainit, 1,440 pounds; 100 pounds double sulphate and magnesia, 1,470 pounds; 40 pounds kemfert, 1,450 pounds.

These plats will be fertilized in the same way and cotton planted on them again in 1926. No rust, wilt, or disease of any kind appeared on any of this cotton, while on land in our main experiment field where cotton has frequently been grown for the past seven years, rust was present everywhere except on plats that had received potash, and wilt was present in several places where it had never been seen before. On two plats where from 1919 to 1924 we had conducted work with fertilizer under cotton, wilt had become so bad by 1924 as to practically destroy the stand.

On one-half of these two plats last named we used in 1925 acid phosphate and nitrate of soda alone and on the other one-half we used these two with kainit added. The cotton wilted badly over the entire area in 1925, but nothing like so badly where kainit had been used as where it had not been used. The yields on both tests were very low at best, but on the plats without potash they were at the rate of 468 pounds of seed cotton per acre, while on plats receiving potash they were at the rate of 828 pounds per acre. The addition of the potash affected the yield both in its control of rust and in its partial control of wilt. We do not believe that any form of potash will control wilt, but on land deficient in potash we feel sure its addition to a fertilizer will give healthier and stronger plants that will better withstand any disease that might attack them.

Better Crops Welcomes Newcomers

THE Fertilizer Review, a 16-page publication issued by the National Fertilizer Association at Washington, D. C., made its appearance in January, 1926. Devoted to the advancement of agriculture through an enlarged and wiser use of fertilizer, the editors state the purpose of the magazine: to be a means of disseminating timely information on the subject matter within its field to farmers; to private, county, state, and federal workers and investigators; to the farm press, and to the fertilizer industry.

The April number has just come to our desk. Like the preceding three, it contains a deal of material of value and interest to the manufacturers and consumers of fertilizers. It covers a broad field of statistics relating to production, reviews of bulletins on fertilizers, editorials on current subjects, and articles on the use of fertilizers and many other subjects. A particularly interesting illustrated article on Muscle Shoals gives detailed information on what is being done there.

As is well known, Charles J. Brand is the executive secretary of the National Fertilizer Association, and is also editor of the Fertilizer Review. Associated with him on the publication are the members of the Soil Improvement Committee: R. H. Smalley, director of the northern division, and J. C. Pridmore, director of the southern division. H. W. Warner is the editorial agronomist.

The magazine is well worth reading and keeping, among other good reasons for the figures it contains on the consumption and manufacture of fertlizer materials.

AN attractive magazine called Plant Food is being published every two months by the Bureau of Agricultural Information of the French Potash Society, 905 Hurt Building, Atlanta, Georgia. This little magazine is well edited, brightly written, and illustrated. It just fits the pocket, is brief and to the point.

The April number contains a very good article on "The Development of the Fertilizer Idea" by Henry T. Maddux. A few pages are devoted to the subject of more cotton on fewer acres. The results of experimental work at some of the southern experimental stations are cited which show particularly the value of potash in producing the maximum yield of cotton free from rust.

The general director of the Bureau, J. N. Harper, is well known as an agronomist. Sid Noble is the editor and is assisted in the publication of the magazine by H. E. Lefevre, director for Northern United States and Canada, and H. T. Maddux, agronomist.

The Annual Convention of the
NATIONAL FERTILIZER ASSOCIATION
will be held at
White Sulphur Springs, West Virginia
June 7 to 12, 1926

Competition

(*From page 4*)

smirkingly claiming that people have *got* to come to you for jewelry because you are the only one who handles it. Have you ever thought of *inviting* them to come in—as the Arcadia does over there? That movie theatre across the street is a competitor for *your* dollar, and they invite folks in with bright lights, advertising, signs—"

"Stop—I see it!" he ejaculated.

He gazed across the sun-drenched street, for the first time seeing the Arcadia in a new light. "A competitor! Huh"! His eyes narrowed. His fist came down. Silverware rattled!

"I'm going to start something in this town tomorrow! I'm going to fight for my share of every dollar spent in this community! *'Invest* in long-lasting jewelry—don't *spend* foolishly'—will be the slogan. I'll advertise. I'll be active. I'll show competition what I can do!"

And for the first time W. Dudley Hammersmith looked and talked like a man.

IN this complicated, inter-dependent world, where American girls bob their hair and Chinese hair-net makers five thousand miles away die of starvation, there is no such thing as a monopoly in anything, and nothing is permanent except change.

One article or service competes—not with similar articles and services—but with every other article or service in the universe.

The doctor's competitor is not another doctor but *the apple,* the tennis court—and Niel's Bar Bell Exerciser!

Men can possess but three things—money, time, and what money can buy and time lend occasion to use. The whole world is competing for its share of each man's time and money, with the result that he must daily make decisions as to *where* to invest and in what.

These decisions are sometimes *"What* car shall we buy?" but more often "Shall we buy a car or help send John to college? We cannot do both"—*proving that a college education can be a competitor of a Chrysler!*

Every man who has a service or an object in which he is interested is subject to two kinds of competition: direct, from those who offer something similar; indirect, from every quarter of the globe.

The County Agent, who hangs over the fence waiting for the farmer to finish the furrow, finds his indirect competition in the farmer's unwillingness to lose time and listen. The rector's direct competitors are the priest, the pastor and the Science reader; his indirect competition is the Sunday morning golf game.

The strong man looks upon direct opposition merely as an indication that he has something for which the competitor is willing to fight. It is proof of the value of what he has to offer. Men don't bother to kick dead horses. It is always the silk hat that lures the snowball.

And he should look upon indirect competition as part of the game, devoting care and thought to plans to overcome it and secure his fair share or more of the rewards.

As we become more and more civilized, and more and more cluttered up with things to do and to buy, the real indirect competitor of the man with something to sell, a plan to put over, or a service to render is *time*—inexorable time.

I think I shall not be contra-

dicted if I assert that all men—rich or poor, wise or ignorant—have but twenty-four hours a day.

The buyer who works six hours and must see twenty-four salesmen can allot but fifteen minutes to each. And the fellow who can't pack into his quarter of an hour the selling punch necessary finds his real competitor the minute hand, not the other salesmen.

The salesman who sold John Wanamaker a battery of change-making cash registers convinced Wanamaker, it is alleged, that his real competitor was not the group of uptown stores but the *clock;* and proved his assertion by showing that many shoppers who came prepared to buy five articles could buy only three, because of the time wasted in waiting for change to come through the old-fashioned pneumatic tubes.

FORD is advocating the five-day week for working people, as he believes that they do not have time to enjoy the purchase of a car and other things they have the money to buy.

Lacking time to use them, they sigh and put the money in the savings bank.

The competition of the clock is *real* competition.

The realization of this is putting men on their mettle; and in laboratory, office and field they are beginning to devise ways to beat "the old man with the scythe."

Folks cannot think of their needs while they are working to earn money. It is in their leisure time that they think up ways to spend just as Ford points out.

So, perhaps our modern Frankenstein monster of a machine civilization will eat itself up because of a lack of time to consume more palatable and digestible things.

DIRECT competition is merely the hurdle in the race of life. The higher the hurdle the more muscles are brought into play and the keener the zest in soaring over it.

Real men do not flinch at opposition—they relish it, as the football player enjoys plowing through the ranks of those whose business it is to down him if they can.

"The greater the obstacle the more glory there is in overcoming it", said Moliere; and the greatest error Suzanne Lenglen, Mistake-Maker Extraordinary, ever was guilty of she made when after winning from Helen Wills she foolishly minimized the skill of her competitor.

Her egotism outbalanced her wisdom. Had she stated with a "Whew!" that Helen was the greatest tennis player she ever met—the world would naturally have accorded to Lenglen the wreath that belongs to one who has vanquished his greatest opponent.

HOW a man views his direct competition is an unfailing measure of his own work.

If he is inspired by it and incited to even greater efforts, then competition is the life of trade, and he is strong; if it irritates and depresses him, it is a rampant raid upon his vitality, and he weakens and sickens.

Yet, after all, a man's real competition is not from the outside, but from within. He must constantly fight the opposition of his own inertia, leap the hurdles his own mistakes set in his path, conquer his inbred laziness and down that virile internal opponent—"I can't."

Competition is merely the salt on the real he-man's oyster!

HIS LAST ROUND

The mayor of Edmonton delights in telling the story of a friend who was out with him in the buffalo preserve when a big bull buffalo took after them. The mayor rolled under the fence, but his friend was not far enough ahead of the buffalo to take a chance. He circled around several times, but each time he approached the fence the buffalo was so close behind that he dared not slow up long enough to crawl under. Finally as he approached the fence he called out to the mayor—

"Tell my wife my insurance policy is in the top drawer of the dresser. This is my last time around."

* * *

Mrs. Murphy — Good morning, Mrs. Flannigan, an' what hev ye named the baby?

Mrs. Flannigan—We've named her Hazel.

Mrs. Murphy—With all the saints there are in heaven, then to name her after a nut!

* * *

"How long did it take your wife to learn how to drive an automobile?"

"It will be ten years in September."

* * *

Grandpa in a motor car
Pushed the lever back too far.
Twinkle, twinkle, little star,
(Music by the G. A. R.)

GONNA RAISE HER OWN

A bride walked briskly into a grocery store, and asked for a couple of good egg plants. As the grocer was wrapping them up, she asked, "How deep should these be planted to get the best results?"

"Planted," said the astonished grocer. "You're not going to plant them, are you?"

"Yes," replied the bride. "My husband won't eat any but strictly fresh eggs and the stores are so unreliable, I have decided to raise my own."—*Progressive Grocer.*

* * *

Ford made the worst mistake of his life when he made the new car four inches wider, the Iola (Kan.) *Register* believes, "Just think," argues the *Register,* "how many times in the past you have missed one by less than that. You'll hit them all now."

* * *

Visitor—"If your mother gave you a large apple and a small one, and told you to divide with your brother, which apple would you give him?"

Johnny—"D'ye mean my big brother or my little one?"—*De Laval Monthly.*

* * *

THE DIFFERENCE

"Modernists say 'there ain't no hell.' Fundamentalists say 'the hell there ain't."—The Rev. James Shera Montgomery, Chaplain of the House of Representatives.

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Look back . . . then ahead

In 1920

Indiana farmers used 25,129.73 tons of available phosphoric acid and 3,462.31 tons of actual potash. This averages 7.3 tons of phosphoric acid to every ton of potash. The chart above shows the comparison.

In 1924

Farmers in the same State used 29,379.70 tons of available phosphoric acid and 8,788.90 tons of actual potash. Note how potash increased—one ton to every 3.3 tons of phosphoric acid—the use of potash was more than doubled.

LOOK back a few years at a typical corn state . . Indiana.

In 1920 her farmers used less than 3½ thousand tons of potash . . but in 1924 they used more than 8½ thousand tons of actual potash in their fertilizers.

Indiana is progressive. Her increasing use of potash is due to progressive farming methods . . more intensive cropping . . proper maintenance of soil fertility.

Look ahead . . are you maintaining the fertility of your soil? Are you keeping in line with other progressive farms?

Do your small grains lodge . . do you fail to get a catch of clover . . is your corn chaffy? If so, the percentage of potash in your fertilizer could be profitably increased.

Give more attention to the productivity of your soil . . a slight increase in your use of potash may mean a big increase in your profit.

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